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FORESTS OF EAST TEXAS, 1953-55

HIGHLIGHTS

Forest area in east Texas totals 11.6 million acres. This is 9 percent more than in 1935.

Acreage of pine and oak-pine forests has increased 7 percent, oak-hickory forests have increased 35 percent, and bottomland hardwoods have declined 5 percent.

Growing stock volume totals 7 billion cubic feet, including 26 billion board feet of sawtimber.

Softwood sawtimber volume has risen 26 percent in the Southeast region but has declined 46 percent in the Northeast. Volume of hardwood sawtimber in both regions is about the same now as in 1935.

Timber growth is 440 million cubic feet annually. The 1954 cut was 302 million cubic feet. Pine sawtimber was overcut in the Northeast.

Southern Forest Experiment Station, New Orleans, Louisiana
Forest Service, U. S. Dept. of Agriculture

FOREWORD

The Forest Survey of east Texas is a part of the national inventory being conducted by the U. S. Forest Service. The purposes of the Survey are (1) to take inventory of the supply of standing timber and other forest products, (2) to ascertain the rate at which this supply is being increased through growth, (3) to determine the rate at which this supply is being diminished through use, and by fire, insects, disease, and other destructive agencies.

The Southern Forest Experiment Station is responsible for the Survey in Texas, Alabama, Arkansas, Louisiana, Mississippi, Oklahoma, and Tennessee. Philip R. Wheeler, chief of the Division of Forest Economics, is in charge of the work.

Large-scale cooperative assistance made it possible to complete the east Texas Forest Survey sooner than would have been possible with Federal funds alone. Cooperation in the form of manpower, equipment use, or aerial photography was received from the following organizations:

Texas Forest Service

Champion Paper and Fibre Company

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The very material aid of these organizations, and of the individuals in them, is gratefully acknowledged.

PHILIP A. BRIEGLEB, Director
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Figure 1.— Forest Survey regions of east Texas.

FORESTS OF EAST TEXAS, 1953-55

This is a report on the forests of east Texas--the amount and kind of timber they contain, the industries they support, and the opportunities for enhancing their productivity. Though primarily the product of the new Forest Survey of east Texas, the report also draws on the first Forest Survey of 1935 to show changes in forest conditions.

During the 20 years between the two Surveys, Texas made the difficult transition from dependence on virgin timber to widespread use of second growth. The rate of use of standing timber fluctuated widely as the Nation experienced both the worst depression and the highest prosperity in its history. Too, the character of the Texas wood-using industry changed markedly. Most notable was the establishment of three multi-million dollar pulp and paper mills. In lumber, there was a shift toward smaller operations adapted to harvesting the volunteer stands that sprang up after the original timber was cut over.

What happened to the forests during these momentous years? The new Survey shows that in Southeast Texas, where nearly half the forest is in big industrial and public holdings, there is a clear trend toward increased stocking and timber growth. Timber supplies are greater today than 20 years ago. With continued expansion of current forestry programs, it appears that this region's wood-using industries can confidently look forward to an increasing resource.

The forestry gains in Southeast Texas have not been duplicated in the region directly northward. For one reason or another, the small landowners who hold most of the forest in the Northeast have not taken advantage of their opportunities. Over-cutting has greatly reduced the stocking of merchantable trees. Fire and grazing have taken toll of promising young growth. Competing low-quality trees have reduced the space available to desirable timber. Further depletion of these forests will make the job of rehabilitation slower and more costly. The small landowner must be convinced of the growth potential of his woodland and helped to get it under management while he still has some timber to work with. Increased effort by both public and private agencies is clearly needed if the region is to share fully in the State's expanding forest economy.

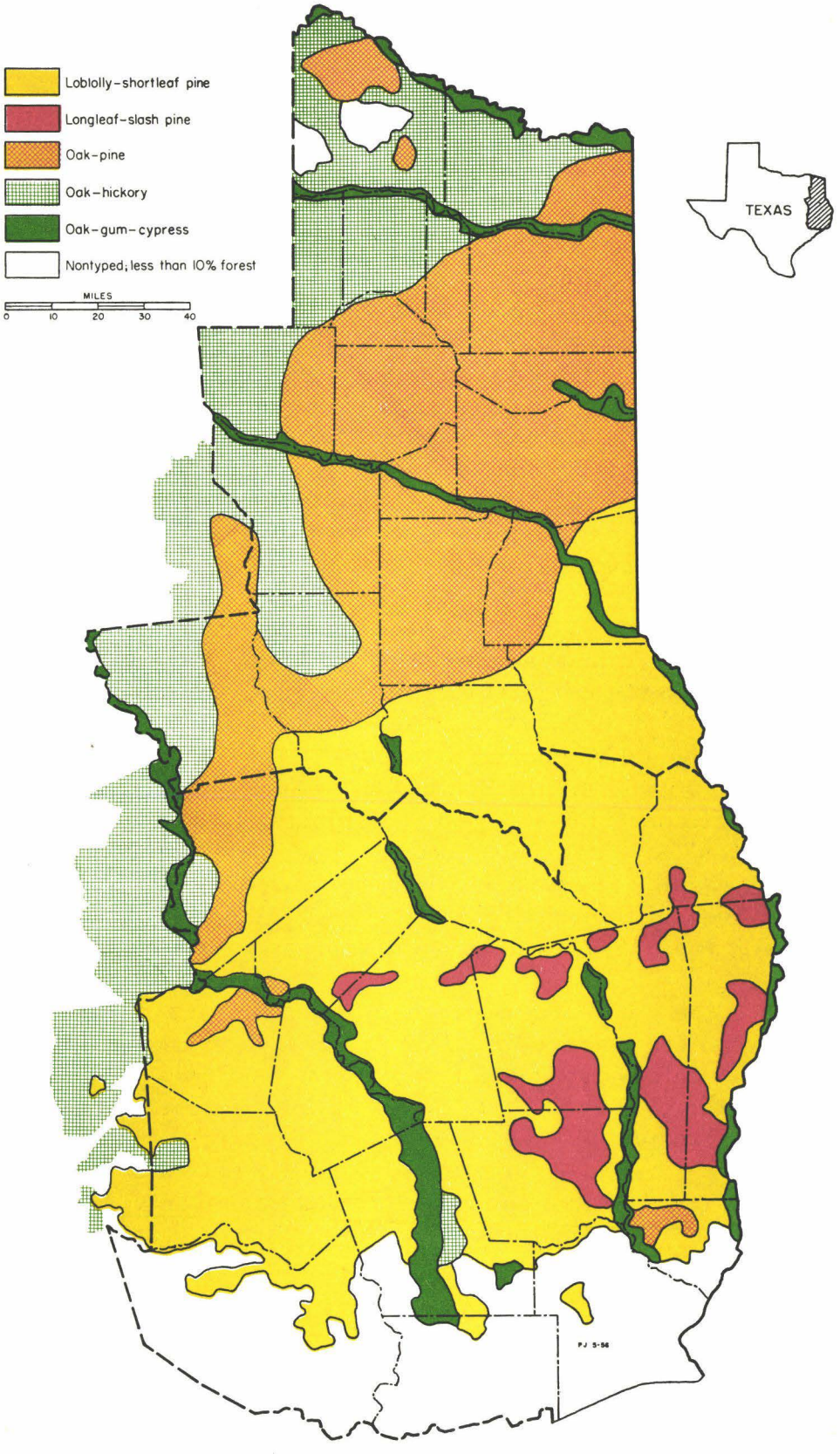


Figure 2.—Major forest types in east Texas.

THE FOREST RESOURCE

Forest Land

Forest acreage has increased. --East Texas is timber country. From the prairies that parallel the Gulf Coast, commercial forests extend 300 miles northward to the Red River. From the Louisiana border, they stretch 80 to 120 miles west, to the point where rainfall becomes generally insufficient to support good commercial stands.

Of the 19 million acres of land in east Texas, 61 percent is in forest[1/]. Land clearing on the better agricultural soils and for urban and industrial development has reduced forest acreage in some localities during the past two decades. But these declines have been overshadowed by reversion to forest of abandoned farm land. The net result of the shifts in land use is that the present forest area of 11.6 million acres is 9 percent--or almost one million acres--more than in the mid-1930's.

In the northeastern counties about half of the land is in forest, typically in small tracts intermingled with cultivated land (fig. 1). Restocking of open land has increased forest acreage by 14 percent since 1935.

The Southeast, center of the State's pulp and paper industry, is more heavily wooded. Here, forests cover two-thirds of the land. Present forest area is 5 percent greater than in 1935.

Of the commercial forest land in east Texas, large forest industries own 27 percent, farmers 21, and other private owners 45. The remaining 7 percent is held by public agencies.

Softwood types predominate. --Two-thirds of the forest acreage in east Texas is in softwood types. Most extensive is the loblolly-shortleaf pine type, which occupies 5.2 million acres (fig. 2). Forests of longleaf pine, almost entirely in the southeastern counties, cover nearly a half million acres; much of the area formerly in longleaf was taken over by loblolly pine after the old growth was cut. On an additional 2.2 million acres, southern pines are heavily mixed with oak, gum, hickory, and other hardwoods.

1/ Definitions of terms will be found on p. 22.

Forests of oak-gum-cypress and elm-ash-cottonwood, occurring along rivers and streams, occupy 1.8 million acres. Oak-hickory stands predominate on 1.9 million acres in the uplands.

Some changes have occurred during the past 20 years in the area occupied by the various timber types (table 1). Land clearing reduced the acreage of bottomland hardwoods. Planting and the reversion of many old fields to pine increased the softwood acreage. But cutting preference for pine converted some mixed oak-pine stands to oak types. The net effect is that the proportion of forest area occupied by softwood types has fallen off in the Northeast region but risen in the Southeast.

Table 1.--Commercial forest land by forest type (1953-55) and change between Surveys

Forest type-group	East Texas		Northeast		Southeast	
	Commercial forest	Change	Commercial forest	Change	Commercial forest	Change
	Thousand acres	Percent	Thousand acres	Percent	Thousand acres	Percent
Softwood[1/]	7,836.5	+ 7	2,432.6	+ 2	5,403.9	+ 9
Oak-hickory	1,940.4	+35	1,361.8	+43	578.6	+19
Bottomland hardwood[2/]	1,798.9	- 5	775.1	+16	1,023.8	-16
Total	11,575.8	+ 9	4,569.5	+14	7,006.3	+5

1/ Includes loblolly-shortleaf pine, longleaf-slash pine, and oak-pine types.
2/ Includes oak-gum-cypress and elm-ash-cottonwood types.

Two-fifths of stands are sawtimber size.--Sawtimber stands, the main source of industrial wood, cover 39 percent of the commercial forest area in east Texas. Poletimber stands make up most of the remainder (fig. 3).

There is great variation among timber types in the area occupied by various stand-size classes. Nearly half of the loblolly-shortleaf pine type, for example, is in sawtimber stands. But only 17 percent of the oak-hickory stands are of this size. In other types, the proportion of area in sawtimber ranges between these two extremes.

Regional variations are notable. In the Northeast, only 20 percent of the forest is in sawtimber stands. This contrasts with 51 percent in the Southeast, where good forest management is more common.

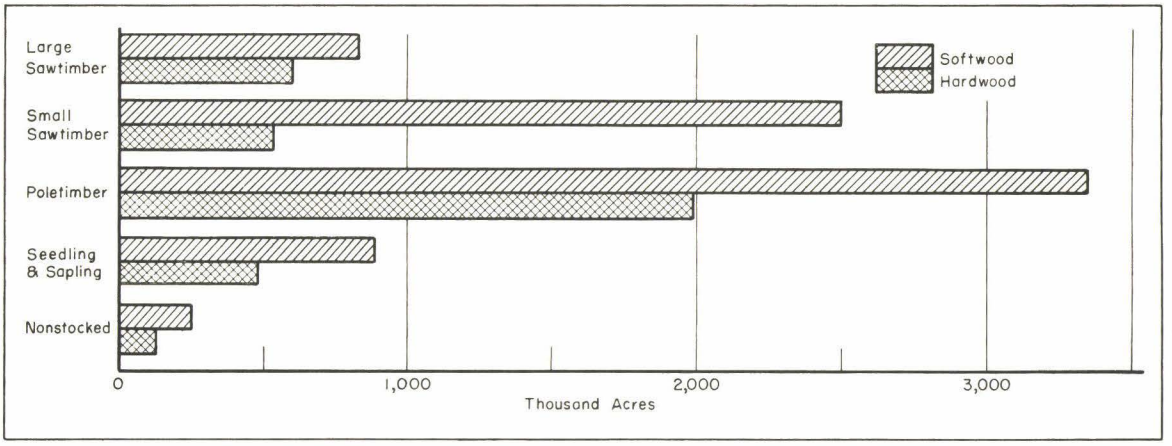


Figure 3. --Forest area by stand size and forest-type group.

Most of the forest is well stocked. --Tree stocking, as measured by the Forest Survey, reflects the extent to which growing space is effectively utilized by sound, well-formed trees of commercial species.

Fifty-nine percent of the forest land is well stocked in the sense that it contains at least 70 percent of the number of good trees (including established seedlings) required for full stocking (fig. 4). Twenty-nine percent is medium-stocked, having 40 to 69 percent of full stocking. Ten percent is poorly (10 to 39 percent) stocked, and 2 percent is nonstocked.

Stocking is best in the southeastern counties and in the loblolly-shortleaf pine type. Conditions are noticeably below par in the longleaf pine type--nearly half of it is nonstocked or poorly stocked.

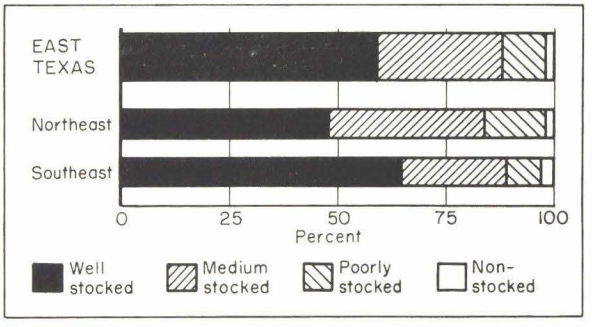


Figure 4. --Degree of stocking by region.

Forest growth is hampered by an accumulation of cull trees. More than one-fifth of the total basal area of all live trees at least 5 inches in d. b. h. is in culls, virtually all hardwoods. Utilizing or deadening those cull hardwoods not essential for wildlife food and cover will enable the forests to produce more merchantable volume than they are currently doing.

Some idea of the job involved in cull hardwood removal may be gained from table 2, which shows the average number of culls per acre

Table 2.--Number of cull hardwood trees per acre by diameter and Survey region, 1953-55

Tree diameter (inches)	East Texas	Northeast	Southeast
		- - - Number - - -	
2- 4	105	79	121
6-10	14	14	14
12-14	3	4	3
16-18	1	1	1
20+	1	1	1
Total	124	99	140

by tree diameter. Thus, to rid the average stand of all hardwood culls 5.0 inches and larger would mean killing 19 trees per acre, most of them under 11 inches in diameter. Ax-girdling the culls in the average stand would take about one man-hour per acre; machine girdling would require only one-third as much time.

Timber Volume

Growing stock has increased.--Growing stock in east Texas totals 7.3 billion cubic feet--an average of 630 cubic feet or 9 cords per acre. The total is somewhat greater than in 1935. Nearly three-fourths of the growing stock is in the Southeast region.

Important regional changes in growing stock have occurred. As table 3 indicates, softwood volume has risen sharply in the Southeast and declined in the Northeast. Hardwood, on the other hand, has increased in both regions. The increases and decreases in volume are partly explained by marked changes in the size of the timber.

Table 3.--Growing stock volume (1953-55) and change between Surveys

Region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million cu. ft.	Percent	Million cu. ft.	Percent
Northeast	789.4	-39	1,172.9	+12
Southeast	3,187.9	+23	2,132.0	+11
Total	3,977.3	+ 2	3,304.9	+11

In the Southeast the stand tables indicate a greatly improved situation between Surveys (fig. 5). Softwoods in all tree sizes through 20 inches have increased in number--more than 20 percent in most size classes. The smaller improvement in 6- to 10-inch trees reflects partly the effect of heavy cutting for pulpwood on some tracts and partly the fact that on managed holdings less growing space is usually occupied by small trees. Increases above 12 inches are especially noteworthy. Only softwoods over 22 inches declined in number; depletion of this large timber is helping to sustain production while stocking in medium sizes is building up. Among hardwoods, there have been considerable increases in sizes below 20 inches in diameter.

In the Northeast the impact of heavy pine cutting is apparent. Reduction in softwood numbers extends down through the 6-inch class. Though large hardwoods have also been reduced in number, hardwoods have been cut less heavily than softwoods. Most of the hardwood in the Northeast is found in the uplands. Here, pine would be preferable.

Regional changes in timber volume and in number of desirable trees seem to be associated with size of ownership and interest displayed in improved forest management. In the Northeast, for example, the bulk of the forest is on farms or in other small tracts. But in the Southeast, where preferred softwoods increased, nearly half the forest is held by large forest industries (i.e., ownerships of more than 50,000 acres each) and public agencies.

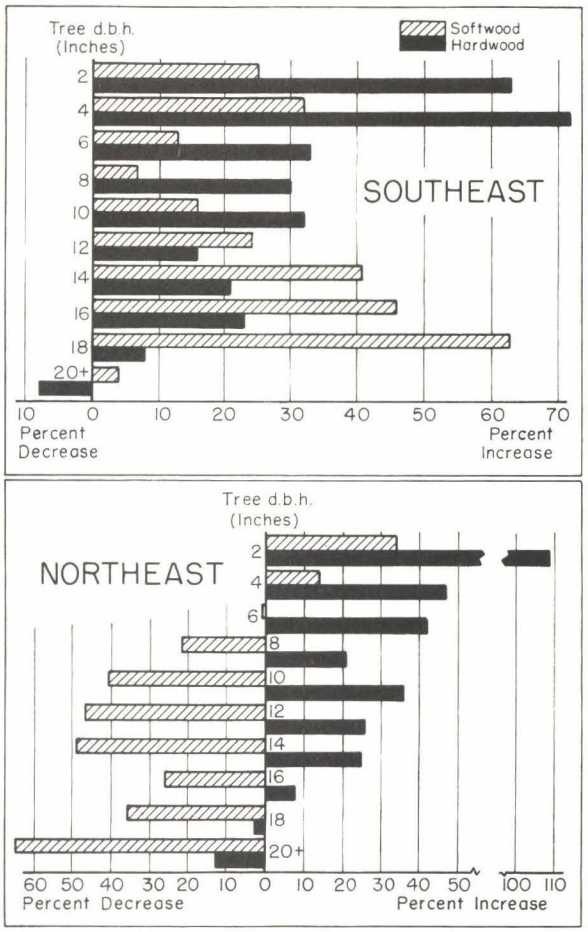


Figure 5.--Change in number of live trees between Surveys by region.

In general, public lands and the holdings of large forest industries are being managed so as to build up growing stock. It is not surprising, therefore, that there is a much heavier concentration of timber on these properties than on other ownerships. On public holdings, growing stock averages about 1,060 cubic feet (15 cords) per acre. Large industrial holdings average 860 cubic feet per acre as compared to less than 500 cubic feet on all other private ownerships.

Softwood sawtimber volume has risen in Southeast.--The volume of sawtimber in east Texas now stands at 26.5 billion board feet, of which nearly half is in trees at least 15.0 inches in d.b.h. (fig. 6).

Southern pines--chiefly loblolly--make up 65 percent of the sawtimber volume. All other softwoods, largely cypress but including

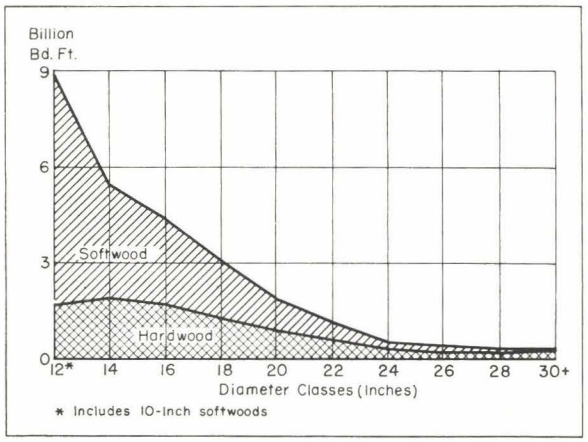


Figure 6. --Distribution of sawtimber volume by diameter class.

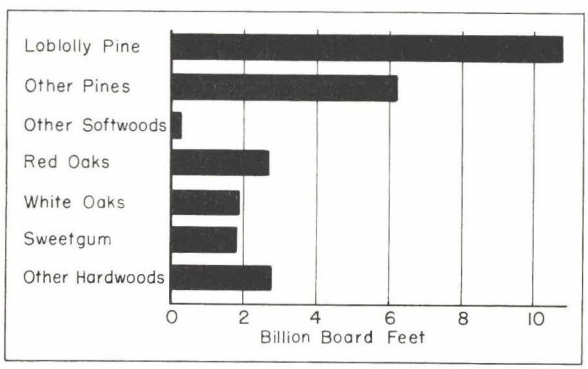


Figure 7. --Sawtimber volume by species.

Table 4. --Sawtimber volume (1953-55) and change between Surveys

Region	Softwood		Hardwood	
	Volume	Change	Volume	Change
	Million bd. ft.	Percent	Million bd. ft.	Percent
Northeast	2,943.0	-46	2,853.6	+2
Southeast	14,429.9	+26	6,263.4	+2
Total	17,372.9	+ 2	9,117.0	+2

some redcedar, total barely 1 percent. Among hardwoods, red and white oaks lead with 17 percent of the total sawtimber volume. Sweetgum, blackgum, and tupelo gum add up to 10 percent; pecan and hickory to 2 percent; and all other hardwoods to 5 percent (fig. 7).

Trends in sawtimber volume between Surveys, shown in table 4, generally parallel those in growing stock. Most significant are the striking regional changes in softwood sawtimber. Another point to note is that the smaller regional changes indicated for hardwood sawtimber volume relative to growing stock mean that small hardwoods are increasing at a rate faster than are sawtimber trees.

Further indication of sawtimber trends may be gained from average volumes per acre. Southeast Texas, which averaged 2,660 board feet at the time of the first Survey, now averages 2,950 board feet. In Northeast Texas, average volume plunged from 2,080 board feet per acre to 1,270.

For the whole of east Texas, sawtimber volume now averages 2,290 board feet per acre[2/]. Pine types average 2,640 board feet, oak-gum-cypress 2,210, and oak-hickory 950. For sawtimber stands alone, volume averages 5,150 board feet per acre in softwood types and 3,450 in hardwood types.

2/ Comparable volumes for other Gulf States are: Alabama, 1,840 board feet per acre; Florida, 960; Louisiana, 2,830; and Mississippi, 1,780.

Big trees of higher quality. --Timber quality as expressed by log grade is related to tree size. In hardwoods 20 inches and larger in diameter, for example, nearly two-fifths of the volume is in good-quality logs (grades 1 and 2); in 14- to 18-inch trees about one-seventh. But in the 12-inch class, virtually all of the volume is in low-grade logs that are of little immediate use to saw and veneer mills.

Among softwoods, much the same situation prevails with respect to tree size and quality (table 5).

One-fifth of the hardwood sawtimber and one-sixth of the softwood is in grades 1 and 2. A fair proportion of the sawtimber grades low simply because it is of small size. These small trees, however, can provide future high quality--i.e., grade will improve with growth.

Table 5.--Sawtimber volume by log grade and tree diameter, 1953-55

Species group and d.b.h. class (inches)	All grades	Grade 1	Grade 2	Lower grades
		Million board feet		
Softwood:				
10 to 12	7,154.8	0.4	132.7	7,021.7
14 to 18	8,160.5	3.7	1,764.3	6,392.5
20 and up	2,057.6	266.8	524.4	1,266.4
Total	17,372.9	270.9	2,421.4	14,680.6
Hardwood:				
12	1,745.4	...	12.9	1,732.5
14 to 18	4,890.0	69.6	637.2	4,183.2
20 and up	2,481.6	393.2	528.5	1,559.9
Total	9,117.0	462.8	1,178.6	7,475.6
All classes	26,489.9	733.7	3,600.0	22,156.2

Timber Growth and Cut

Net annual growth 440 million cubic feet; sawtimber growth 1.7 billion board feet. --The forests of east Texas are growing 440 million cubic feet annually. This amounts to an average of 38 cubic feet or about 0.5 cord per acre, which is a growth rate of 6.0 percent. Southern pines make up three-fifths of the total growth.

For sawtimber trees alone, annual net growth averages 149 board feet per acre. Sawtimber stands average 297 board feet of net growth in softwood types and 146 board feet in hardwood types. These figures indicate growth under existing conditions. Management practices leading to better stocking and lower mortality do and will, of course, result in higher increments.

Total timber cut 302 million cubic feet; sawtimber cut 1.5 billion board feet. --Timber cutting removed 229 million cubic feet of softwood growing stock and 73 million of hardwood from east Texas forests in 1954 (fig. 8). Virtually all of the softwood was pine. Sweetgum, which is being increasingly used for pulpwood, made up 25 percent of the total

hardwood cut; other soft-textured hardwoods such as blackgum accounted for 7 percent; red and white oaks for 62 percent; and other firm-textured hardwoods like hickory about 6 percent.

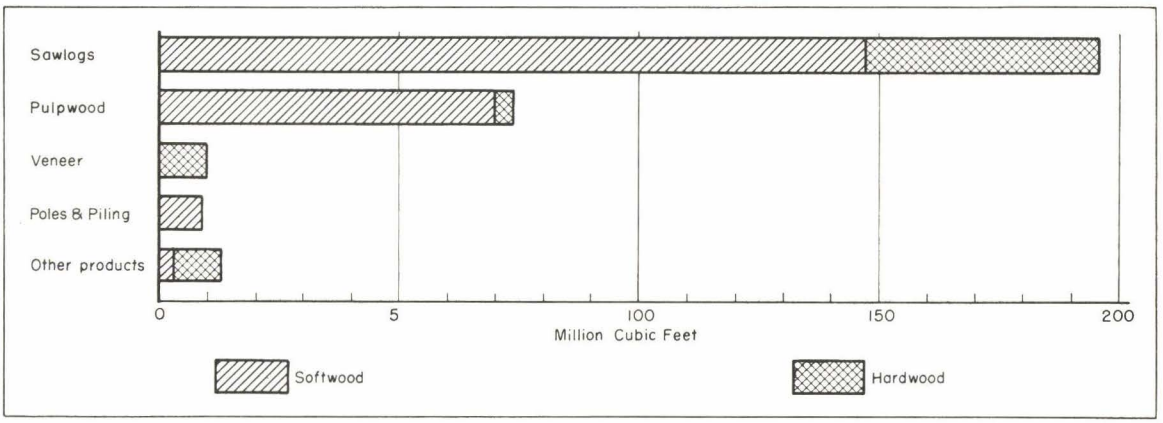


Figure 8. --Annual cut of growing stock.

The most significant relationship of timber cut to growth in east Texas is that of pines 10 inches and larger in diameter (i.e., sawtimber-size trees). Pines of these sizes account for some 70 percent of the total volume of timber cut annually, both softwood and hardwood. Even pulpwood is cut largely from sawtimber-size pine.

It is noteworthy, therefore, that in the Northeast region there is no surplus growth of pine sawtimber with respect to the volume cut. The situation is quite different in Southeast Texas. In this region, pine sawtimber is growing faster than it is being cut. The excess pine growth--together with the long-term upward trend of stocking in the Southeast--augurs a bright future for dependent wood-using plants.

The Pine Fringe

Forests of southern pine extend somewhat beyond the western margin of the Forest Survey regions in east Texas (see type map, page 2). This extension of the pine zone is referred to here as the Pine Fringe.

The Fringe region was not included in the initial Forest Survey of 1935. The new Survey gathered information on timber volumes in the area, but did not estimate timber growth or cut. Included in the Pine Fringe are 21 of the 42 minor civil divisions of the following counties: Grimes, Henderson, Leon, Madison, Van Zandt, and Waller. This area contains all or virtually all of the pine in these counties. Some 60 miles

further west--in and around Bastrop county--is the detached area known as the Lost Pines. This western outpost of southern yellow pines was not examined.

Data on the Fringe forests are included as footnotes to the detailed tables. In brief, commercial forest land in the area amounts to some 600 thousand acres, or 40 percent of the total land. The sawtimber volume is about 749 million board feet, of which one-fourth is pine. It averages 1,260 board feet per acre, considerably less than the 2,290 found in the adjacent forests to the east.

Including stands of mixed oak-pine, the area of pine forests totals some 170 thousand acres. Of the 197 million board feet of pine, over half is in Grimes county alone.

About half of the commercial forest area in the Fringe is occupied by the oak-hickory type. The stands are a part of what is locally called the post oak belt, since this species is the universal dominant of the type. Industrial use of these stands is limited. They supply fence posts, fuelwood, and some lumber.

The remaining Fringe forests are found along rivers and streams. Chief species in these stands are elm, ash, and oak.

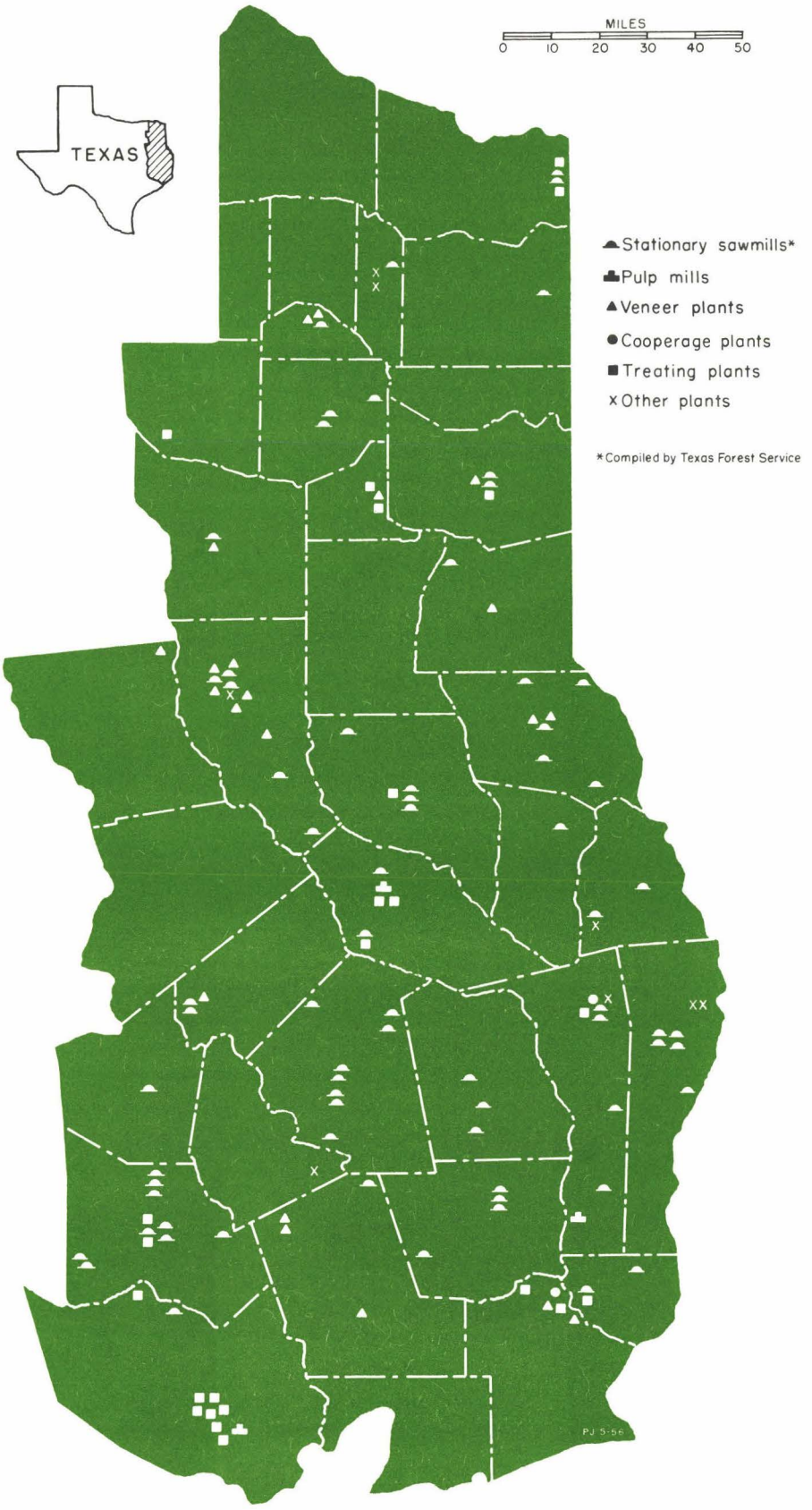


Figure 9.—Location of primary wood-using plants in east Texas, 1954.

FOREST INDUSTRY

The 1954 output of timber commodities in east Texas totaled 280 million cubic feet--217 million of softwood, 63 million of hardwood.

Sawlogs are still the chief timber product. Pine pulpwood also ranks high. These two items comprise nearly 90 percent of the total output (table 6). Hardwood veneer logs, pine poles, fuelwood, fence posts, and hewn ties make up most of the rest.

Lumber output mainly pine.--The bulk of the lumber is sawn at mills cutting more than 3 million board feet annually. These mills are largely in the southeastern counties, where timber is most abundant (fig. 9). Portable mills, which multiplied after the old growth was gone, have declined in number during the past few years. Their decline is partially reflected in production statistics--lumber output is now considerably below the peaks of the 1940's (fig. 10).

Table 6.--Output of round and split timber products, 1954

Product	All species	Softwood	Hardwood
	- - - Percent - - -		
Sawlogs	60	62	56
Pulpwood	28	34	6
Veneer	2	(1/)	11
Cooperage	(1/)	...	(1/)
Fuelwood	4	(1/)	18
Poles and piling	3	3	...
Posts	1	1	3
All other	2	(1/)	6
Total	100	100	100

1/ Negligible.

In 1954 the production of logs for lumber (including sawn crossties) was 1 billion board feet, of which over three-fourths was softwood. Oak and gum supplied most of the hardwood. Virtually all of the softwood was southern pine.

Pulpwood a major claimant of timber.--As in the rest of the southern pine region, pulpwood production in east Texas increased tremendously during the past two decades (fig. 11). Today, pulpwood accounts for a third of the total softwood output. Recent expansion of the pulp and paper industry in the State and bordering areas points to still further increases in pulpwood output.

Out-of-state mills draw heavily on Texas timber for pulpwood. Of the more than one million cords of round pulpwood cut in Texas during 1954, over 40 percent was shipped to mills in Arkansas and Louisiana.

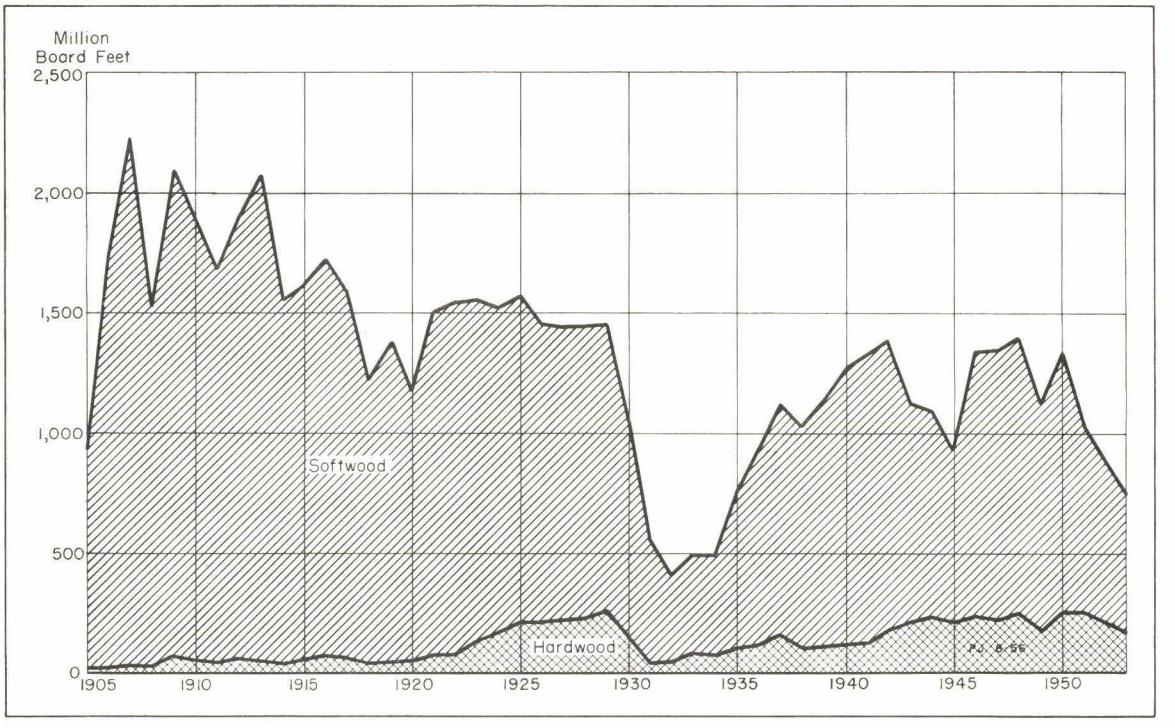


Figure 10.--Lumber production in Texas, 1905-53.

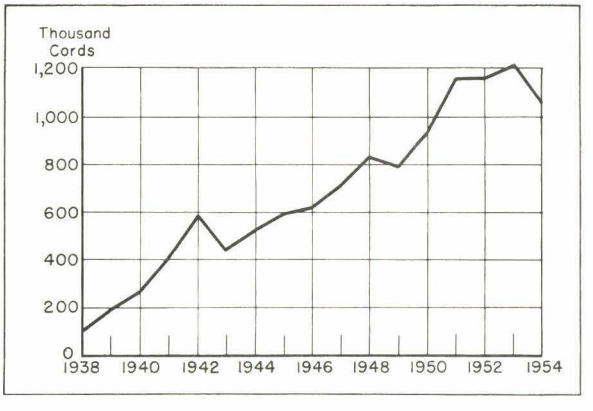


Figure 11.--Pulpwood production in Texas, 1938-54.

Chipped sawmill residues are a new source of raw material for the pulp industry. Although none of the Texas pulp mills reported use of such residues in 1954, at least 5 pine sawmills in the State have recently installed equipment for producing bark-free pulp chips. Installations by other large mills are likely.

Veneer production increases.--Veneer production in east Texas has risen somewhat in the last 20 years. The 21 veneer plants in the region turn out mainly baskets, crates, and other types of packaging; these containers are used largely for transporting truck crops. Small amounts of commercial and face veneers are also produced.

In 1954, the total output of veneer logs in east Texas was 50 million board feet, almost all hardwood. Sweetgum alone accounted for

slightly more than half of the total. Other soft-textured hardwoods provided most of the remainder.

Poles and piling are important. --East Texas is a leading producer of southern pine poles and piling. In all, some 647,000 pines were cut for poles and piling in 1954. This output amounted to 7.4 million cubic feet, of which over 80 percent was cut in the Southeast region.

Practically all of the poles and piling are shipped to Texas wood-preserving plants. Most of the 24 preserving plants in east Texas are of the commercial pressure-type. These plants also treat large quantities of lumber, crossties, fence posts, and miscellaneous items.

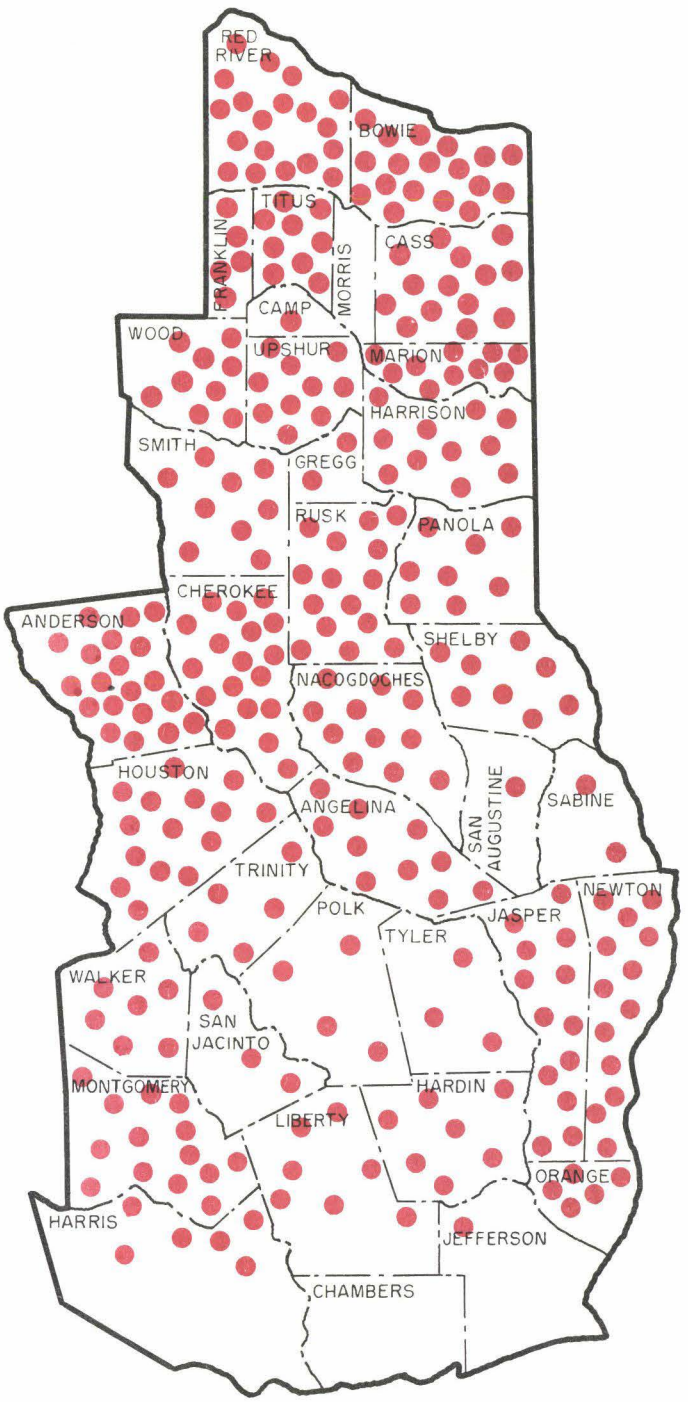
Cooperage production declines. --Strong competition from other types of containers has cut deeply into traditional cooperage markets. In 1937, production of cooperage logs and bolts from the forests of east Texas totaled some 6 million board feet; by 1954 output had dropped to only 1.3 million. Almost all of the 1954 cooperage was white oak, locally manufactured into staves for foreign export.

Large numbers of posts harvested. --Nearly a tenth of the Nation's preservative-treated fence posts were produced in east Texas during 1954. Almost all of these 2 million commercial fence posts were pine. Another 3 million posts were cut and used on farms. The farm-cut posts are mainly of white oak species.

Fuelwood use drops sharply. --The long-term trend of fuelwood in east Texas, as elsewhere in the South, is clearly downward. In the late 1930's, for example, fuelwood production in east Texas was about 1,777,000 cords annually. By 1954 it had fallen off to less than 153,000 cords.

All other products cut in 1954 supplied only 2 percent (4.8 million cubic feet) of the total timber output in east Texas. Of this, hewn ties were the leading item.

OPPORTUNITIES FOR IMPROVING FOREST PRODUCTIVITY



During the 20 years between the two Forest Surveys of east Texas, there was more interest in forestry than during any previous period. Indications of progress are numerous. Organized fire protection was extended to over 10 million acres. Total area of forest plantings increased to more than 200,000 acres. Much industrially owned timberland was placed under supervision of professional foresters. Public agencies and some timber operators began making strong efforts to sell better cutting practices to small landowners. Forest research by State and Federal agencies was considerably expanded.

Although substantial progress has been made, increased efforts are needed. The commercial timber belt of east Texas is essentially a pine-producing region. Of the 11.6 million acres of commercial forest land, about 9.5 million appear to be more valuable for pine than hardwood. Yet much of the area is producing at only a fraction of its capacity. Before full production can be achieved, hardwoods must be controlled wherever they are unduly

Figure 12.--Plantable pine acreage in east Texas. (Each dot represents an average of 10,000 acres.)

encroaching on pine growth, and pines must be planted on a large acreage where natural reseeding is unlikely. The potential benefits from planting and hardwood control are so great that the Forest Survey collected special data on the size and nature of the jobs.

How much forest planting?--Potential pineland in east Texas, as defined by the Forest Survey, includes all the forested uplands except areas occupied by desirable hardwoods such as cherrybark oak and magnolia. Of these uplands, the Survey found some 3 million acres with both an inadequate pine seed source and inadequate pine stocking (fig. 12). For full stocking, part of this area requires complete planting, and the rest needs reinforcement planting.

Planting possibilities loom largest in the loblolly-shortleaf pine zone of Northeast Texas, where the forest is largely in farm woodlands and other small holdings. Early income from pine plantations appears assured by rapidly expanding pulpwood markets. This development should help to stimulate greater interest in planting among small woodland owners.

Many of the hazards encountered in natural regeneration of timber stands are avoided in planting. At the same time, greater skill and knowledge are needed to insure plantation success in east Texas than in better-watered portions of the southern pine region[3/].

Extent of hardwood control job.--Improving species composition on sites better suited to pine than to hardwood is a real challenge to Texas landowners and wood-using industries. Some of the hardwoods on pine sites are outright culls. Others are growing stock, having some present or potential marketability. Where pines are more profitable, cull and low-quality hardwoods should be used or controlled.

The Forest Survey classified all pine sites to determine whether a hardwood problem existed--i. e., whether more than a fifth of the growing space was occupied by hardwoods, both cull and sound trees. The size of the hardwoods was also noted, since it influences the nature of the control work. Hardwood size classes were: small, 2 inches in d. b. h. or less; medium, 3 to 9 inches d. b. h.; and large, 10 inches d. b. h. or over.

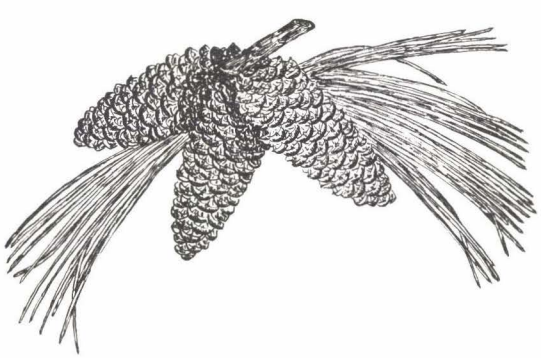
3/ Ferguson, E. R., and Stephenson, G. K. Pine regeneration problems in east Texas: a project analysis. South. Forest Expt. Sta. Occas. Paper 144, 72 pp., illus. 1955.

Some 7.5 million acres of pine sites were found to have a hardwood problem. Small hardwoods dominate on 30 percent of this acreage, medium-size trees on 36 percent, and large hardwoods on 34 percent of the acreage. About 2.3 million acres of the total are adequately stocked with pine. These should be treated first, before the pines are crowded out.

Because small hardwoods are usually too numerous to be treated individually, their control may entail mechanical brush cutters, prescribed burning, aerial spraying, or other wholesale means. Medium-size hardwoods will generally require use of a sprout-preventing chemical; large hardwoods can easily be deadened by girdling. Of course, whenever low-value hardwoods can be sold, landowners will be that much money ahead on the pine improvement job.

It should be emphasized that well-balanced timber stand improvement programs recognize the needs for wildlife habitat as well as other nontimber values of the forest.

Other opportunities.--In addition to restocking idle acres and removing weed hardwoods, there are a number of other important measures that can contribute to increasing future timber supplies. These are (1) to strengthen fire protection facilities in order to cope with periods of above-average fire hazard and to extend protection to the more than 1 million forest acres not yet covered, (2) to intensify protection from insects and disease, (3) to make fuller use of harvested trees, and (4) to improve cutting practices, especially on small holdings.



ACCURACY OF THE SURVEY

The 1953-55 data on forest acreage and timber volume were secured by a systematic sampling method involving a forest-nonforest classification on aerial photographs and on-the-ground measurement of quarter-acre sample plots. In most counties, sample plots were taken in pairs at and near the intersections of a grid of east-west and north-south lines spaced three miles apart. In 17 counties, only 80 percent of the locations (i.e., pairs of plots) as determined from a 3-mile-square grid were sampled.

Accuracy of the estimates may be affected by two types of error. The first stems from the use of a sample to estimate the whole and from variability of the items being sampled. This type is termed sampling error; it is susceptible to a mathematical evaluation of the probability of error. The second type of error derives from human mistakes in measurement, judgment, arithmetic, or recording, and from limitations of method or equipment. Effects of this second type of error--often referred to as reporting and estimating error--cannot be appraised mathematically, but the Forest Survey constantly attempts to hold such error to a minimum by proper training, good supervision, frequent checks, and emphasis on careful work.

Statistical analysis of the data, using random-sampling formulas, indicates a sampling error of plus or minus 0.4 percent for the estimate of total forest area, 2.6 percent for total cubic foot-volume, and 2.6 percent for total board-foot volume. However, because an equispaced systematic sample is generally more efficient than a random sample of the same size, these estimates of sampling error may be considered as setting an upper limit of error, rather than as expressing the actual probability of error. As the acreage and volume totals are broken down by Survey region, county[4/], forest type, species, and other subdivisions of the data, the possibility of error increases and is greatest for the smallest items. The order of this increase is suggested in the following tabulation, which shows the sampling error to which the estimates may be liable two chances out of three.

4/ County data on timber volume have been included in the report to permit grouping of counties into any desired combinations. For this purpose, groups of counties containing a million acres or more of forest land are recommended.

Forest area		Cubic volume		Board-foot volume	
Size of area sampled	Maximum sampling error	Volume sampled	Maximum sampling error	Volume sampled	Maximum sampling error
M acres	Percent	Million cu. ft.	Percent	Million bd. ft.	Percent
12,000	0.4	7,000	2.6	26,000	2.6
9,000	.5	6,000	2.9	20,000	3.0
5,000	.6	3,000	4.1	10,000	4.2
2,000	1.0	1,000	7.0	5,000	6.0
500	1.9	500	9.9	2,000	9.5
100	4.3	100	22.2	300	24.4

Growth estimates are based on radial-growth measurements and mortality data taken on sample plots. No attempt was made to calculate sampling error in these estimates.

Estimates of annual cut were based on the number and size of stumps on recently cut inventory plots. Stumps of all trees cut during the 3-year period preceding date of inventory were recorded and the measurements converted into tree volume. Using production indices, the data were then adjusted to annual cut for a specified year. Supplemental studies were made to provide volume cut by product. The sampling errors to which the 1954 estimates of annual cut are liable, on a probability of two chances out of three, are plus or minus 4.3 percent for growing stock and 5.0 percent for sawtimber volume.

In computing the changes that took place between 1935 and 1953-55, the data from the first Forest Survey were adjusted to make them as closely comparable as possible to data from the second Survey. This was necessary because of certain basic differences between the two sets of data. For example, published estimates from the first Survey were based on a total land area of 18,911,400 acres in east Texas. Since then, more accurate measurement by the U. S. Bureau of the Census has established a revised figure of 19,038,700 acres. Thus, while actual land area has changed little, if at all, the higher estimate of land acreage has affected forest-area and timber-volume estimates in like proportion. Again, the minimum diameter limit for hardwood sawtimber trees was dropped from 13.0 inches d.b.h. on the first Survey to 11.0 inches on the second Survey, in line with changing utilization practices.

In addition to these major points, a number of procedural differences between the two Surveys had to be taken into account. In every case, the data from the first Survey were adjusted to conform to the standards of the second Survey before the change was computed.

The sampling error in the data on change in forest acreage and timber volume cannot be estimated. In the 1935 Survey, sample plots were spaced one-eighth mile apart on lines 10 miles apart. An estimate of sampling error was not made. However, error in the estimate of total forest acreage was probably very small; and the indicated change in total forest acreage may be considered essentially correct. Indicated changes for Survey regions and other portions of the total acreage should be valued in proportion to the magnitude of the item and of the change. Changes in timber volume, because of the possible effect of nonsampling as well as sampling errors, are shown only for major groupings of the data.

DEFINITION OF TERMS

Forest Land

Forest land. Includes: (a) land which is at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting an influence on the climate or on the water regime; (b) land from which the trees have been removed to less than 10 percent stocking and which has not been developed for other use; (c) afforested areas.

Commercial forest land. Forest land which is (a) producing, or is physically capable of producing, usable crops of wood (usually sawtimber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land. Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order but which otherwise qualifies as commercial forest land and (b) incapable of yielding usable wood products (usually sawtimber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Tree Species

Commercial species. Includes species that normally have value for commercial timber products; excludes so-called weed or noncommercial species such as blackjack oak, scrub post oak, blue beech, sourwood, etc.

Softwoods. Coniferous species, of which the most numerous are loblolly pine (Pinus taeda); shortleaf pine (P. echinata); and longleaf pine (P. palustris).

Hardwoods. Broadleaved species of which the most numerous are the oaks (Quercus spp.) and sweetgum (Liquidambar styraciflua).

Forest Type

Forest type is determined upon the basis of the predominant species as indicated by cubic volume for sawtimber and poletimber stands, and number of trees for seedling-sapling stands.

Longleaf-slash pine. Forests in which 50 percent or more of the stand is longleaf or slash pine, singly or in combination. (Common associates include other southern pines, oak, and gum.)

Loblolly-shortleaf pine. Forests in which 50 percent or more of the stand is loblolly pine, shortleaf pine, or other southern yellow pines excepting longleaf or slash pine, singly or in combination. (Common associates include oak, hickory, and gum.)

Oak-pine. Forests in which 50 percent or more of the stand is hardwoods, usually upland oaks, but in which southern pines make up 25 - 49 percent of the stand. (Common associates include gum, hickory, and yellow-poplar.)

Oak-hickory. Forests in which 50 percent or more of the stand is upland oaks or hickory, singly or in combination except where pines comprise 25 - 49 percent in which case the stand would be classified "oak-pine." (Common associates include yellow-poplar, elm, maple, and black walnut.)

Oak-gum-cypress. Bottomland forests in which 50 percent or more of the stand is tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, except where pines comprise 25 - 49 percent in which case the stand would be classified "oak-pine." (Common associates include cottonwood, willow, ash, elm, hackberry, and maple.)

Elm-ash-cottonwood. Forests in which 50 percent or more of the stand is elm, ash, or cottonwood, singly or in combination. (Common associates include willow, sycamore, beech, and maple.)

Class of Timber

Sawtimber trees. Live trees of commercial species at least 9.0 inches d.b.h. in softwoods and 11.0 inches d.b.h. in hardwoods, that contain at least a 12-foot merchantable butt log--or, if the butt log is a cull, at least 50 percent of the gross sawlog volume is in merchantable logs. To be merchantable, a log must meet the following requirements:

(a) In softwoods, logs having a minimum 6-inch small-end diameter inside bark and at least one-third sound, with sweep or crook not exceeding two-thirds the small-end diameter.

(b) In hardwoods, logs having a minimum 8-inch small-end diameter inside bark and which meet the specifications of a standard lumber log or a tie and timber log.

Poletimber trees. Trees of commercial species which meet regional specifications of soundness and form, and which are of the following diameters at breast height: softwoods 5.0 to 9.0 inches; hardwoods 5.0 to 11.0 inches. (Such trees will usually become sawtimber trees if left to grow.)

Seedling and sapling trees. Live trees of commercial species less than 5.0 inches in diameter at breast height and of good form and vigor.

Cull trees. Live trees of sawtimber or poletimber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Rotten cull trees. Live trees of sawtimber or poletimber size which fail to meet regional specifications of proportion of sound volume to total volume.

Sound cull trees. Live trees of sawtimber or poletimber size which meet regional specifications of freedom from rot but will not make at least one merchantable sawlog now or prospectively according to regional specifications because of roughness, poor form, or species.

Hardwood limbs. Limbs of hardwood sawtimber trees and sawtimber-size cull hardwood trees to a minimum diameter of 4.0 inches inside bark.

Stand-size Class

Large sawtimber. Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International 1/4-inch rule, and at least half of this volume in sawtimber trees 15.0 inches d.b.h. and larger.

Small sawtimber. Stands with sawtimber trees having a minimum net volume per acre of 1,500 board feet, International 1/4-inch rule, but which do not meet the specifications for large sawtimber.

Poletimber. Stands failing to meet the sawtimber stand specification, but at least 10 percent stocked with poletimber and larger (5.0 inches d.b.h. and larger) trees and with at least half the minimum stocking in poletimber trees.

Seedling and sapling. Stands not qualifying as either sawtimber or poletimber stands, but having at least 10 percent stocking of trees of commercial species and with at least half the minimum stocking in seedling and sapling trees.

Nonstocked and other areas. Commercial forest land not qualifying as sawtimber, poletimber, or seedling and sapling stands.

Tree Stocking

Stocking is the extent to which growing space is effectively utilized by present or potential growing-stock trees of commercial species. Stands are considered to be well stocked when the percentage of full stocking is 70 or above, medium stocked when the percentage is 40 to 69, poorly stocked when the percentage is 10 to 39, and nonstocked when the percentage is under 10.

Volume

Sawtimber volume. Net volume in board feet, International 1/4-inch rule, of live sawtimber trees to a specified merchantable top.

Growing stock. Net volume in cubic feet of live sawtimber and live poletimber trees from stump to a minimum 4.0-inch top diameter (of central stem) inside bark.

All-timber volume. Net volume in cubic feet of live and salvable dead sawtimber trees and poletimber trees of commercial species, and cull trees of all species from stump to a minimum 4.0-inch top inside bark. Includes bole only of softwoods but both bole and limbs of hardwoods to a minimum 4.0-inch diameter inside bark.

Basal Area

Basal area. Cross-sectional area, including bark, of trees at breast height, measured in square feet.

Diameter

D.b.h. (diameter breast high). Tree diameter in inches, outside bark, measured at 4-1/2 feet above ground.

Diameter class. The 2-inch diameter classes extend from 1.0 inch below to 0.9 inch above the stated midpoint. Thus, the 12-inch class includes trees 11.0 inches to and including 12.9 inches d.b.h.

Growth

Net annual growth of sawtimber. The change during a specified year in net board-foot volume of live sawtimber on commercial forest land resulting from natural causes.

Net annual growth of growing stock. The change during a specified year in net cubic-foot volume of growing stock on commercial forest land resulting from natural causes.

Mortality

Annual mortality. The net volume, excluding salvage, removed from live sawtimber and from growing stock during a specified year through death from natural causes.

Cut

Annual cut of sawtimber. The net board-foot volume of live sawtimber trees cut or killed by logging on commercial forest land during a specified year.

Annual cut of growing stock. The net cubic-foot volume of live sawtimber and poletimber trees cut or killed by logging on commercial forest land during a specified year.

Output

Timber products output. The volume of timber products cut from both growing stock and other sources.

Softwood Log Grades [5]

Softwood log grades are based on the value yield per unit outturn of yard lumber. The value of lumber yield may be expressed relative to the value of No. 2 Common lumber taken as 100 percent. Expressed thus, studies have shown that lumber from grade 1 logs has a value 244 percent as great as No. 2 Common lumber, while the corresponding percentages are 189 percent for grade 2 logs, 142 percent for grade 3 logs, and 107 percent for grade 4 logs.

Hardwood Log Class

Specifications for standard lumber logs (hardwood log grades 1, 2, and 3) are based on suitability for standard factory lumber. [6] Studies have shown that for nearly all species tested, the yield of No. 1 Common and better lumber in grade 1 logs varies from 65 to 80 percent; in grade 2 logs from 40 to 64 percent; and in grade 3 logs from 13 to 36 percent.

Tie and timber logs are suitable for ties, timbers, and certain other construction lumber items. Specifications for tie and timber logs are based chiefly on knot size and log soundness; clear cuttings are not required.

Stand Quality

Fair and better. A stand in which at least four grade-2 or better logs are present per acre.

Poor. A stand in which fewer than four grade-2 or better logs are present per acre.

5/ For detailed specifications of log grades, see "Interim log grades for southern pine." Southern Forest Experiment Station, 18 pp. 1953.
6/ For detailed specifications of log grades, see "Hardwood log grades for standard lumber: proposals and results." U. S. Forest Products Laboratory D1737. 1949.

DETAILED TABLES

The following tables present detailed statistics on the forests of east Texas. Supplemental data on the Pine Fringe are in footnotes.

Table 7.--Forest and nonforest land[1/] by Survey region, 1953-55

Land use	East Texas	Northeast	Southeast
	- - - Thousand acres - - -		
Forest:			
Commercial	11,575.8	4,569.5	7,006.3
Noncommercial:			
Productive-reserved	5.4	2.1	3.3
Unproductive	74.6	60.6	14.0
Total forest	11,655.8	4,632.2	7,023.6
Nonforest[2/]	7,382.9	4,094.8	3,288.1
All land	19,038.7	8,727.0	10,311.7

1/ Acreage in the Pine Fringe is as follows:

Land use	Acreage
	Thousand acres
Commercial forest	596.1
Noncommercial forest	33.9
Nonforest	884.0
All land	1,514.0

2/ Includes some acreage classifiable as water according to Survey standards of area classification but defined by the Bureau of Census as land.

Table 8.--Commercial forest land by class of ownership, 1953-55

Class of ownership	Commercial forest	
	Thousand acres	Percent
Private:		
Farm	2,457.4	21.2
Other	8,351.2	72.2
Total private	10,808.6	93.4
Public:		
National forest	655.0	5.7
Other federal	81.4	.7
State	28.7	.2
County and municipal	2.1	(1/)
Total public	767.2	6.6
All ownerships	11,575.8	100.0

1/ Negligible.

Table 9.--Land area[1] and commercial forest[1] by county, 1953-55

County	All land	Commercial forest		County	All land	Commercial forest	
	Thousand acres	Thousand acres	Percent		Thousand acres	Thousand acres	Percent
Anderson	683.5	367.2	53.7	Nacogdoches	616.3	409.5	66.4
Angelina	548.5	461.8	84.2	Newton	602.2	571.4	94.9
Bowie	589.4	324.3	55.0	Orange	227.8	145.6	63.9
Camp	121.6	43.5	35.8	Panola	563.2	319.0	56.6
Cass	617.6	336.6	54.5	Polk	700.2	608.9	87.0
Chambers	395.5	37.6	9.5	Red River	661.1	324.0	49.0
Cherokee	674.5	399.0	59.2	Rusk	604.2	312.2	51.7
Franklin	187.5	75.2	40.1	Sabine	361.0	298.7	82.7
Gregg	181.8	88.3	48.6	San Augustine	391.7	290.6	74.2
Hardin	572.8	509.2	88.9	San Jacinto	396.2	316.8	80.0
Harris	1,107.2	285.8	25.8	Shelby	524.2	305.2	58.2
Harrison	570.9	281.3	49.3	Smith	601.0	199.9	33.3
Houston	788.4	501.8	63.6	Titus	267.5	129.5	48.4
Jasper	620.2	544.0	87.7	Trinity	450.6	360.7	80.0
Jefferson	604.8	53.1	8.8	Tyler	593.3	546.4	92.1
Liberty	750.7	505.0	67.3	Upshur	377.0	192.6	51.1
Marion	256.0	184.2	72.0	Walker	503.0	384.3	76.4
Montgomery	697.6	584.6	83.8	Wood	462.7	201.4	43.5
Morris	167.0	76.6	45.9	All counties	19,038.7	11,575.8	60.8

1/ Acreage in the Pine Fringe is as follows:

County	Total land area	Surveyed portion[2]		
		All land	Commercial forest	
	Thousand acres	Thousand acres	Thousand acres	Percent
Grimes	512.6	512.6	190.0	37.1
Henderson	601.6	220.2	74.2	33.7
Leon	703.4	384.4	226.7	59.0
Madison	305.9	191.7	26.3	13.7
Van Zandt	547.2	139.3	42.8	30.7
Waller	324.5	65.8	36.1	54.9
Total	2,995.2	1,514.0	596.1	39.4

2/ In the 6 counties shown, Forest Survey coverage was limited to the 21 (of 42) minor civil divisions containing all or virtually all of the pine in these counties.

Table 10. --Commercial forest land[1/] by stand size and forest type, by Survey region, 1953-55

Forest type	All stand sizes	Large saw-timber	Small saw-timber	Pole-timber	Seedling and sapling	Nonstocked and other areas[2/]
			Thousand acres			
			EAST TEXAS			
Softwood types:						
Longleaf-slash pine	482.1	26.7	129.0	113.8	80.3	132.3
Loblolly-shortleaf pine	5,198.4	639.9	1,921.5	2,012.2	536.1	88.7
Oak-pine	2,156.0	168.6	452.2	1,227.3	276.6	31.3
Total	7,836.5	835.2	2,502.7	3,353.3	893.0	252.3
Hardwood types:						
Oak-hickory	1,940.4	134.7	192.6	1,160.8	361.4	90.9
Elm-ash-cottonwood	74.6	15.9	8.4	44.2	6.1	...
Oak-gum-cypress	1,724.3	451.9	337.5	789.8	114.1	31.0
Total	3,739.3	602.5	538.5	1,994.8	481.6	121.9
All types	11,575.8	1,437.7	3,041.2	5,348.1	1,374.6	374.2
			NORTHEAST			
Softwood types:						
Longleaf-slash pine	9.7	...	...	9.7	...	...
Loblolly-shortleaf pine	1,386.6	93.2	316.5	684.7	248.8	43.4
Oak-pine	1,036.3	22.1	101.7	681.6	205.2	25.7
Total	2,432.6	115.3	418.2	1,376.0	454.0	69.1
Hardwood types:						
Oak-hickory	1,361.8	34.2	98.4	839.9	322.3	67.0
Elm-ash-cottonwood	48.4	3.1	8.4	30.8	6.1	...
Oak-gum-cypress	726.7	150.8	99.4	406.2	57.0	13.3
Total	2,136.9	188.1	206.2	1,276.9	385.4	80.3
All types	4,569.5	303.4	624.4	2,652.9	839.4	149.4
			SOUTHEAST			
Softwood types:						
Longleaf-slash pine	472.4	26.7	129.0	104.1	80.3	132.3
Loblolly-shortleaf pine	3,811.8	546.7	1,605.0	1,327.5	287.3	45.3
Oak-pine	1,119.7	146.5	350.5	545.7	71.4	5.6
Total	5,403.9	719.9	2,084.5	1,977.3	439.0	183.2
Hardwood types:						
Oak-hickory	578.6	100.5	94.2	320.9	39.1	23.9
Elm-ash-cottonwood	26.2	12.8	...	13.4	...	...
Oak-gum-cypress	997.6	301.1	238.1	383.6	57.1	17.7
Total	1,602.4	414.4	332.3	717.9	96.2	41.6
All types	7,006.3	1,134.3	2,416.8	2,695.2	535.2	224.8

1/ Acreage in the Pine Fringe is as follows:

Forest type	All stand sizes	Saw-timber	Pole-timber	Other areas
		Thousand acres		
Loblolly-shortleaf pine	127.6	39.0	47.2	41.4
Oak-pine	43.0	16.3	22.2	4.5
Oak-hickory	287.7	22.8	202.1	62.8
Bottomland hardwood	137.8	52.0	63.3	22.5
Total	596.1	130.1	334.8	131.2

2/ Includes areas not classified elsewhere.

Table 11.--Commercial forest land[1/] by degree of tree stocking and forest type, by Survey region, 1953-55

Forest type	All stocking	Well stocked	Medium stocked	Poorly stocked	Non-stocked
		Thousand acres			
EAST TEXAS					
Softwood types:					
Longleaf-slash pine	482.1	119.7	142.0	95.0	125.4
Loblolly-shortleaf pine	5,198.4	3,552.5	1,119.3	462.3	64.3
Oak-pine	2,156.0	1,250.1	672.5	209.3	24.1
Total	7,836.5	4,922.3	1,933.8	766.6	213.8
Hardwood types:					
Oak-hickory	1,940.4	886.2	725.1	270.2	58.9
Elm-ash-cottonwood	74.6	34.4	34.1	6.1	...
Oak-gum-cypress	1,724.3	927.1	636.9	145.7	14.6
Total	3,739.3	1,847.7	1,396.1	422.0	73.5
All types	11,575.8	6,770.0	3,329.9	1,188.6	287.3
NORTHEAST					
Softwood types:					
Longleaf-slash pine	9.7	2.9	6.8	...	...
Loblolly-shortleaf pine	1,386.6	758.5	368.2	224.2	35.7
Oak-pine	1,036.3	487.1	381.6	146.3	21.3
Total	2,432.6	1,248.5	756.6	370.5	57.0
Hardwood types:					
Oak-hickory	1,361.8	531.7	583.2	208.7	38.2
Elm-ash-cottonwood	48.4	25.3	17.0	6.1	...
Oak-gum-cypress	726.7	360.7	296.1	67.0	2.9
Total	2,136.9	917.7	896.3	281.8	41.1
All types	4,569.5	2,166.2	1,652.9	652.3	98.1
SOUTHEAST					
Softwood types:					
Longleaf-slash pine	472.4	116.8	135.2	95.0	125.4
Loblolly-shortleaf pine	3,811.8	2,794.0	751.1	238.1	28.6
Oak-pine	1,119.7	763.0	290.9	63.0	2.8
Total	5,403.9	3,673.8	1,177.2	396.1	156.8
Hardwood types:					
Oak-hickory	578.6	354.5	141.9	61.5	20.7
Elm-ash-cottonwood	26.2	9.1	17.1	...	...
Oak-gum-cypress	997.6	566.4	340.8	78.7	11.7
Total	1,602.4	930.0	499.8	140.2	32.4
All types	7,006.3	4,603.8	1,677.0	536.3	189.2

1/ Acreage in the Pine Fringe is as follows:

Forest type	All stocking	Well stocked	Medium stocked	Poorly and nonstocked
		Thousand acres		
Loblolly-shortleaf pine	127.6	60.6	42.3	24.7
Oak-pine	43.0	21.5	21.5	...
Oak-hickory	287.7	61.6	172.1	54.0
Bottomland hardwood	137.8	52.0	68.8	17.0
Total	596.1	195.7	304.7	95.7

Table 12. --Area of sawtimber stands[1/] by stand quality and forest type, by Survey region, 1953-55

Forest type	All qualities	Fair or better	Poor
	- - - - - Thousand acres - - - - -		
		EAST TEXAS	
Softwood types:			
Longleaf-slash pine	155.7	39.2	116.5
Loblolly-shortleaf pine	2,561.4	1,281.1	1,280.3
Oak-pine	620.8	242.8	378.0
Total	3,337.9	1,563.1	1,774.8
Hardwood types:			
Oak-hickory	327.3	92.6	234.7
Elm-ash-cottonwood	24.3	10.5	13.8
Oak-gum-cypress	789.4	397.9	391.5
Total	1,141.0	501.0	640.0
All types	4,478.9	2,064.1	2,414.8
		NORTHEAST	
Softwood types:			
Longleaf-slash pine	...	...	...
Loblolly-shortleaf pine	409.7	146.4	263.3
Oak-pine	123.8	31.9	91.9
Total	533.5	178.3	355.2
Hardwood types:			
Oak-hickory	132.6	26.2	106.4
Elm-ash-cottonwood	11.5	4.5	7.0
Oak-gum-cypress	250.2	112.1	138.1
Total	394.3	142.8	251.5
All types	927.8	321.1	606.7
		SOUTHEAST	
Softwood types:			
Longleaf-slash pine	155.7	39.2	116.5
Loblolly-shortleaf pine	2,151.7	1,134.7	1,017.0
Oak-pine	497.0	210.9	286.1
Total	2,804.4	1,384.8	1,419.6
Hardwood types:			
Oak-hickory	194.7	66.4	128.3
Elm-ash-cottonwood	12.8	6.0	6.8
Oak-gum-cypress	539.2	285.8	253.4
Total	746.7	358.2	388.5
All types	3,551.1	1,743.0	1,808.1

1/ Acreage in the Pine Fringe is as follows:

Forest type	All qualities	Fair or better	Poor
	- - Thousand acres - -		
Loblolly-shortleaf pine	39.0	8.5	30.5
Oak-pine	16.3	2.8	13.5
Oak-hickory	22.8	5.9	16.9
Bottomland hardwood	52.0	32.0	20.0
Total	130.1	49.2	80.9

Table 13.--Basal area per acre[1/] of growing stock and cull trees by forest-type group and Survey region, 1953-55

Forest-type group	East Texas	Northeast	Southeast
		Square feet	
Longleaf-slash pine:			
2- and 4-inch good trees[2/]	4.3	11.6	4.1
Growing stock	20.6	24.2	20.5
2- and 4-inch poor trees	2.4	2.5	2.4
Cull trees	2.2	2.5	2.2
All trees	29.5	40.8	29.2
Loblolly-shortleaf pine:			
2- and 4-inch good trees[2/]	13.9	14.6	13.7
Growing stock	45.3	36.6	48.4
2- and 4-inch poor trees	3.1	2.2	3.5
Cull trees	7.0	6.0	7.3
All trees	69.3	59.4	72.9
Oak-pine:			
2- and 4-inch good trees[2/]	11.1	10.1	12.0
Growing stock	34.7	27.3	41.6
2- and 4-inch poor trees	3.5	2.6	4.3
Cull trees	12.1	11.9	12.2
All trees	61.4	51.9	70.1
All softwood types:			
2- and 4-inch good trees[2/]	12.6	12.7	12.4
Growing stock	40.8	32.6	44.6
2- and 4-inch poor trees	3.2	2.3	3.6
Cull trees	8.1	8.5	7.9
All trees	64.7	56.1	68.5
Oak-hickory:			
2- and 4-inch good trees[2/]	8.1	7.7	8.9
Growing stock	28.1	25.4	34.5
2- and 4-inch poor trees	3.5	2.9	4.9
Cull trees	14.1	13.6	15.3
All trees	53.8	49.6	63.6
Elm-ash-cottonwood:			
2- and 4-inch good trees[2/]	15.1	20.3	5.5
Growing stock	38.8	35.8	44.5
2- and 4-inch poor trees	5.8	6.0	5.5
Cull trees	12.7	11.4	15.0
All trees	72.4	73.5	70.5
Oak-gum-cypress:			
2- and 4-inch good trees[2/]	7.7	6.9	8.3
Growing stock	45.3	38.4	50.3
2- and 4-inch poor trees	5.1	4.1	5.8
Cull trees	20.1	21.7	19.0
All trees	78.2	71.1	83.4
All types:			
2- and 4-inch good trees[2/]	11.1	10.4	11.6
Growing stock	39.4	31.4	44.5
2- and 4-inch poor trees	3.5	2.8	4.0
Cull trees	10.9	12.2	10.1
All trees	64.9	56.8	70.2

1/ Average basal area per acre in the Pine Fringe is as follows:

All types:	Square feet
2- and 4-inch good trees[2/]	5.5
Growing stock	30.9
2- and 4-inch poor trees	5.1
Cull trees	15.6
All trees	57.1

2/ Includes only sound, well-formed trees.

Table 14. --Total volume[1/] by class of timber and species, by Survey region, 1953-55

Species	All timber[2/]	Growing stock			Poletimber trees	Hardwood limbs	Cull trees
		Total growing stock	Sawtimber trees				
			Sawlog portions	Upper stems			
	Thousand cords						
EAST TEXAS							
Softwood:							
Loblolly pine	31,443	31,310	24,037	1,787	5,486	...	133
Shortleaf pine	18,474	18,349	12,166	1,002	5,181	...	125
Longleaf pine	2,452	2,449	1,997	161	291	...	3
Slash pine	94	94	6	1	87	...	(3/)
Other softwoods	989	828	644	68	116	...	161
Total	53,452	53,030	38,850	3,019	11,161	...	422
Hardwood:							
Red oaks	20,367	13,692	6,266	3,394	4,032	2,344	4,331
White oaks	15,170	10,332	4,358	2,427	3,547	1,577	3,261
Sweetgum	11,717	9,736	4,195	1,968	3,573	411	1,570
Black and tupelo gums	4,755	3,787	1,914	898	975	227	741
Other hardwoods	19,811	11,780	4,861	2,549	4,370	1,428	6,603
Total	71,820	49,327	21,594	11,236	16,497	5,987	16,506
All species	125,272	102,357	60,444	14,255	27,658	5,987	16,928
NORTHEAST							
Softwood:							
Loblolly pine	3,321	3,272	2,321	203	748	...	49
Shortleaf pine	7,074	6,980	4,172	368	2,440	...	94
Longleaf pine	5	5	5	(3/)	...	...	...
Slash pine	77	77	3	1	73	...	(3/)
Other softwoods	219	191	123	16	52	...	28
Total	10,696	10,525	6,624	588	3,313	...	171
Hardwood:							
Red oaks	6,782	4,190	1,802	1,034	1,354	813	1,779
White oaks	6,758	4,341	1,616	945	1,780	687	1,730
Sweetgum	4,460	3,551	1,401	687	1,463	145	764
Black and tupelo gums	1,013	769	333	179	257	48	196
Other hardwoods	8,298	4,655	1,694	939	2,022	561	3,082
Total	27,311	17,506	6,846	3,784	6,876	2,254	7,551
All species	38,007	28,031	13,470	4,372	10,189	2,254	7,722
SOUTHEAST							
Softwood:							
Loblolly pine	28,122	28,038	21,716	1,584	4,738	...	84
Shortleaf pine	11,400	11,369	7,994	634	2,741	...	31
Longleaf pine	2,447	2,444	1,992	161	291	...	3
Slash pine	17	17	3	(3/)	14	...	(3/)
Other softwoods	770	637	521	52	64	...	133
Total	42,756	42,505	32,226	2,431	7,848	...	251
Hardwood:							
Red oaks	13,585	9,502	4,464	2,360	2,678	1,531	2,552
White oaks	8,412	5,991	2,742	1,482	1,767	890	1,531
Sweetgum	7,257	6,185	2,794	1,281	2,110	266	806
Black and tupelo gums	3,742	3,018	1,581	719	718	179	545
Other hardwoods	11,513	7,125	3,167	1,610	2,348	867	3,521
Total	44,509	31,821	14,748	7,452	9,621	3,733	8,955
All species	87,265	74,326	46,974	9,883	17,469	3,733	9,206

1/ Volume in the Pine Fringe is as follows:

Class of material	Softwood	Hardwood
	Thousand cords	
Sawtimber trees	492	2,036
Poletimber trees	177	982
Cull trees	7	1,201
Hardwood limbs	...	391
Salvable dead trees	...	15
Total, all timber	676	4,625

2/ Sound volume in dead trees considered salvable is not included. This volume totals 412 thousand cords.

3/ Negligible.

Table 15. --Total volume[1/] by class of timber and species, by Survey region, 1953-55

Species	All timber[2/]	Growing stock				Hardwood limbs	Cull trees
		Total growing stock	Sawtimber trees		Poletimber trees		
			Sawlog portions	Upper stems			
	Million cubic feet						
EAST TEXAS							
Softwood:							
Loblolly pine	2,358.2	2,348.2	1,802.8	134.0	411.4	...	10.0
Shortleaf pine	1,385.5	1,376.2	912.5	75.1	388.6	...	9.3
Longleaf pine	183.9	183.7	149.8	12.1	21.8	...	.2
Slash pine	7.1	7.1	.4	.1	6.6	...	(3/)
Other softwoods	74.2	62.1	48.3	5.1	8.7	...	12.1
Total	4,008.9	3,977.3	2,913.8	226.4	837.1	...	31.6
Hardwood:							
Red oaks	1,364.6	917.3	419.8	227.4	270.1	157.1	290.2
White oaks	1,016.4	692.3	292.0	162.6	237.7	105.6	218.5
Sweetgum	785.0	652.3	281.1	131.8	239.4	27.5	105.2
Black and tupelo gums	318.5	253.7	128.2	60.2	65.3	15.2	49.6
Other hardwoods	1,327.4	789.3	325.7	170.8	292.8	95.7	442.4
Total	4,811.9	3,304.9	1,446.8	752.8	1,105.3	401.1	1,105.9
All species	8,820.8	7,282.2	4,360.6	979.2	1,942.4	401.1	1,137.5
NORTHEAST							
Softwood:							
Loblolly pine	249.1	245.4	174.1	15.2	56.1	...	3.7
Shortleaf pine	530.5	523.5	312.9	27.6	183.0	...	7.0
Longleaf pine	.4	.4	.4	(3/)	...	...	...
Slash pine	5.8	5.8	.2	.1	5.5	...	(3/)
Other softwoods	16.4	14.3	9.2	1.2	3.9	...	2.1
Total	802.2	789.4	496.8	44.1	248.5	...	12.8
Hardwood:							
Red oaks	454.4	280.7	120.7	69.3	90.7	54.5	119.2
White oaks	452.8	290.9	108.3	63.3	119.3	46.0	115.9
Sweetgum	298.8	237.9	93.9	46.0	98.0	9.7	51.2
Black and tupelo gums	67.8	51.5	22.3	12.0	17.2	3.2	13.1
Other hardwoods	556.0	311.9	113.5	62.9	135.5	37.6	206.5
Total	1,829.8	1,172.9	458.7	253.5	460.7	151.0	505.9
All species	2,632.0	1,962.3	955.5	297.6	709.2	151.0	518.7
SOUTHEAST							
Softwood:							
Loblolly pine	2,109.1	2,102.8	1,628.7	118.8	355.3	...	6.3
Shortleaf pine	855.0	852.7	599.6	47.5	205.6	...	2.3
Longleaf pine	183.5	183.3	149.4	12.1	21.8	...	.2
Slash pine	1.3	1.3	.2	(3/)	1.1	...	(3/)
Other softwoods	57.8	47.8	39.1	3.9	4.8	...	10.0
Total	3,206.7	3,187.9	2,417.0	182.3	588.6	...	18.8
Hardwood:							
Red oaks	910.2	636.6	299.1	158.1	179.4	102.6	171.0
White oaks	563.6	401.4	183.7	99.3	118.4	59.6	102.6
Sweetgum	486.2	414.4	187.2	85.8	141.4	17.8	54.0
Black and tupelo gums	250.7	202.2	105.9	48.2	48.1	12.0	36.5
Other hardwoods	771.4	477.4	212.2	107.9	157.3	58.1	235.9
Total	2,982.1	2,132.0	988.1	499.3	644.6	250.1	600.0
All species	6,188.8	5,319.9	3,405.1	681.6	1,233.2	250.1	618.8

1/ Volume in the Pine Fringe is as follows:

Class of material	Softwood	Hardwood
	Million cubic feet	
Sawtimber trees	36.9	136.4
Poletimber trees	13.3	65.8
Cull trees	.5	80.5
Hardwood limbs	...	26.2
Salvable dead trees	...	1.0
Total, all timber	50.7	309.9

2/ Sound volume in dead trees considered salvable is not included. This volume totals 29 million cubic feet.

3/ Negligible.

Table 16. --Sawtimber volume[1/] and growing stock[1/] by species group and county, 1953-55

County	Growing stock			Sawtimber volume		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	- - - - Million cubic feet - - - -			- - - - Million board feet - - - -		
Anderson	154.5	40.1	114.4	424.0	164.4	259.6
Angelina	310.9	204.3	106.6	1,233.9	969.9	264.0
Bowie	142.5	26.1	116.4	323.7	86.5	237.2
Camp	11.8	4.5	7.3	34.6	12.4	22.2
Cass	129.5	41.3	88.2	342.0	118.9	223.1
Chambers	22.9	16.2	6.7	88.9	68.7	20.2
Cherokee	161.7	92.5	69.2	487.4	328.0	159.4
Franklin	19.8	4.3	15.5	40.3	4.8	35.5
Gregg	26.9	11.1	15.8	54.6	12.5	42.1
Hardin	411.7	237.5	174.2	1,649.2	1,145.1	504.1
Harris	149.4	77.9	71.5	493.0	284.1	208.9
Harrison	103.6	35.0	68.6	265.3	96.6	168.7
Houston	358.9	225.0	133.9	1,517.7	1,129.4	388.3
Jasper	369.6	219.3	150.3	1,417.4	968.4	449.0
Jefferson	45.3	9.1	36.2	148.2	40.2	108.0
Liberty	431.6	157.8	273.8	1,578.4	749.0	829.4
Marion	64.9	30.9	34.0	190.1	112.9	77.2
Montgomery	381.9	276.2	105.7	1,415.8	1,146.9	268.9
Morris	46.4	4.5	41.9	131.9	22.3	109.6
Nacogdoches	231.7	132.8	98.9	816.8	572.6	244.2
Newton	386.7	224.7	162.0	1,423.2	948.6	474.6
Orange	169.1	92.1	77.0	701.0	459.1	241.9
Panola	172.5	78.4	94.1	548.1	300.7	247.4
Polk	528.7	353.6	175.1	2,118.1	1,570.3	547.8
Red River	148.0	28.8	119.2	435.5	95.5	340.0
Rusk	137.0	71.8	65.2	377.2	223.8	153.4
Sabine	254.5	145.5	109.0	1,002.2	626.7	375.5
San Augustine	254.8	149.4	105.4	1,045.2	705.9	339.3
San Jacinto	288.1	176.9	111.2	1,196.9	837.9	359.0
Shelby	200.6	124.1	76.5	791.2	581.6	209.6
Smith	73.2	21.5	51.7	200.4	64.8	135.6
Titus	29.2	2.3	26.9	46.1	4.9	41.2
Trinity	238.2	171.1	67.1	970.3	774.4	195.9
Tyler	457.9	284.0	173.9	1,738.5	1,268.6	469.9
Upshur	44.4	20.9	23.5	106.0	70.7	35.3
Walker	259.7	167.3	92.4	955.4	736.7	218.7
Wood	64.1	18.5	45.6	181.4	69.1	112.3
All counties	7,282.2	3,977.3	3,304.9	26,489.9	17,372.9	9,117.0

1/ Volume in the Pine Fringe is as follows:

County[2/]	Growing stock		Sawtimber	
	Soft-wood	Hard-wood	Soft-wood	Hard-wood
	Million cu. ft.		Million bd. ft.	
Grimes	23.3	40.5	106.4	99.6
Henderson	5.7	23.8	17.4	68.0
Leon	3.4	104.1	12.7	284.0
Madison	.3	12.7	...	42.8
Van Zandt	6.5	16.1	27.7	47.0
Waller	11.0	5.0	34.0	9.8
Total	50.2	202.2	198.2	551.2

2/ In the 6 counties shown, Forest Survey coverage was limited to the 21 (of 42) minor civil divisions containing all or virtually all of the pine in these counties.

Table 17.--Growing stock[1/] by species and Survey region, 1953-55

Species	East Texas	Northeast	Southeast
		Million cubic feet	
Softwood:			
Loblolly pine	2,348.2	245.4	2,102.8
Shortleaf pine	1,376.2	523.5	852.7
Longleaf pine	183.7	.4	183.3
Slash pine	7.1	5.8	1.3
Cypress	60.2	13.8	46.4
Other softwoods	1.9	.5	1.4
Total	3,977.3	789.4	3,187.9
Hardwood:			
Black, scarlet, and southern red oaks	314.7	131.3	183.4
Cherrybark, Shumard, and northern red oaks	110.9	20.8	90.1
Water oaks	491.7	128.6	363.1
White oak (Q. alba)	170.1	42.4	127.7
Other white oaks	522.2	248.5	273.7
Pecan	56.3	23.9	32.4
Other hickories	177.2	94.6	82.6
Sweetgum	652.3	237.9	414.4
Black and tupelo gums	253.7	51.5	202.2
Cottonwood	2.9	2.0	.9
Willow	29.1	20.2	8.9
Soft maple	22.6	6.0	16.6
Sweetbay and magnolia	81.1	3.3	77.8
Elm	154.9	66.3	88.6
Ash	104.0	43.2	60.8
Hackberry	44.7	21.3	23.4
Beech	44.8	3.9	40.9
Sycamore	13.2	1.0	12.2
Other hardwoods	58.5	26.2	32.3
Total	3,304.9	1,172.9	2,132.0
All species	7,282.2	1,962.3	5,319.9

1/ Volume in the Pine Fringe is as follows:

Species	Volume
	Million cubic feet
Loblolly pine	26.9
Shortleaf pine	22.9
Other softwoods	.4
Soft hardwoods	31.5
Oaks	114.9
Other hard hardwoods	55.8
Total	252.4

Table 18 --Distribution of growing stock by species within each forest type, 1953-55

Species	All types	Longleaf-slash pine	Loblolly-shortleaf pine	Oak-pine	Oak-hickory	Elm-ash-cottonwood	Oak-gum-cypress
				Percent			
Softwood:							
Loblolly pine	32.2	9.1	50.4	21.5	3.4	0.3	3.0
Shortleaf pine	18.9	6.0	29.8	12.9	2.4	...	(1/)
Longleaf pine	2.5	79.9	.9	.2	.1	...	...
Slash pine	.1	1.7	.1	...	...	...	...
Other softwoods	.9	...	.1	(1/)	(1/)	.2	4.9
Total	54.6	96.7	81.3	34.6	5.9	.5	7.9
Hardwood:							
Black, scarlet, and southern red oaks	4.4	1.8	3.1	7.3	14.0	(1/)	0.4
Cherrybark, Shumard, and northern red oaks	1.5	...	.6	2.2	2.3	...	3.8
Water oaks	6.8	.1	1.8	8.3	8.2	10.3	22.1
White oak (Q. alba)	2.3	...	1.4	5.3	6.3	...	.7
Other white oaks	7.2	.1	3.1	11.7	22.5	.2	8.8
Pecan	.8	...	(1/)	(1/)	.1	2.3	4.4
Other hickories	2.4	.3	1.1	3.6	10.0	.5	1.9
Sweetgum	9.0	.6	4.6	14.7	13.8	13.5	16.4
Black and tupelo gums	3.5	.2	1.3	4.2	3.9	.9	10.6
Cottonwood	(1/)	...	...	(1/)	...	4.1	.1
Willow	.4	...	.1	.4	.1	34.9	.5
Maple	.4	...	.1	.5	.9	(1/)	1.2
Sweetbay and magnolia	1.1	.2	.4	1.9	1.6	...	2.5
Elm	2.1	...	.5	2.0	3.4	3.4	7.5
Ash	1.4	...	.3	1.0	1.7	9.8	5.5
Hackberry	.6	...	(1/)	.2	.2	4.3	3.3
Beech	.6	...	.1	.9	3.5	...	.3
Sycamore	.2	...	(1/)	.6	(1/)	7.1	.2
Other hardwoods	.7	...	.2	.6	1.6	8.2	1.9
Total	45.4	3.3	18.7	65.4	94.1	99.5	92.1
All species	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1/ Negligible.

Table 19.--Growing stock[1/] by species and stand size, by Survey region, 1953-55

Species	All stand sizes	Large saw-timber	Small saw-timber	Pole-timber	Seedling and sapling	Nonstocked and other areas[2/]
			Million cubic feet			
EAST TEXAS						
Softwood:						
Loblolly pine	2,348.2	697.9	1,196.5	420.4	28.1	5.3
Shortleaf pine	1,376.2	195.1	814.7	346.2	18.3	1.9
Longleaf pine	183.7	26.5	115.8	26.1	11.1	4.2
Slash pine	7.1	...	.1	3.2	3.8	...
Other softwoods	62.1	19.0	37.9	4.2	1.0	...
Total	3,977.3	938.5	2,165.0	800.1	62.3	11.4
Hardwood:						
Red oaks	917.3	254.0	304.3	339.3	18.6	1.1
White oaks	692.3	148.5	206.3	306.1	26.9	4.5
Sweetgum	652.3	151.8	214.9	261.0	22.5	2.1
Black and tupelo gums	253.7	87.8	90.7	71.5	3.2	.5
Other hardwoods	789.3	253.9	217.6	288.8	23.7	5.3
Total	3,304.9	896.0	1,033.8	1,266.7	94.9	13.5
All species	7,282.2	1,834.5	3,198.8	2,066.8	157.2	24.9
NORTHEAST						
Softwood:						
Loblolly pine	245.4	57.3	92.1	85.1	10.1	0.8
Shortleaf pine	523.5	55.9	241.4	210.0	15.1	1.1
Longleaf pine	.4	...	...	.4	...	...
Slash pine	5.8	...	...	2.2	3.6	...
Other softwoods	14.3	2.4	10.2	1.7	(3/)	(3/)
Total	789.4	115.6	343.7	299.4	28.8	1.9
Hardwood:						
Red oaks	280.7	53.7	65.3	152.6	8.4	0.7
White oaks	290.9	27.0	63.2	180.8	17.5	2.4
Sweetgum	237.9	25.0	68.1	131.0	13.2	.6
Black and tupelo gums	51.5	8.7	10.6	31.6	.6	...
Other hardwoods	311.9	68.9	55.8	170.3	16.3	.6
Total	1,172.9	183.3	263.0	666.3	56.0	4.3
All species	1,962.3	298.9	606.7	965.7	84.8	6.2
SOUTHEAST						
Softwood:						
Loblolly pine	2,102.8	640.6	1,104.4	335.3	18.0	4.5
Shortleaf pine	852.7	139.2	573.3	136.2	3.2	.8
Longleaf pine	183.3	26.5	115.8	25.7	11.1	4.2
Slash pine	1.3	...	.1	1.0	.2	...
Other softwoods	47.8	16.6	27.7	2.5	1.0	...
Total	3,187.9	822.9	1,821.3	500.7	33.5	9.5
Hardwood:						
Red oaks	636.6	200.3	239.0	186.7	10.2	0.4
White oaks	401.4	121.5	143.1	125.3	9.4	2.1
Sweetgum	414.4	126.8	146.8	130.0	9.3	1.5
Black and tupelo gums	202.2	79.1	80.1	39.9	2.6	.5
Other hardwoods	477.4	185.0	161.8	118.5	7.4	4.7
Total	2,132.0	712.7	770.8	600.4	38.9	9.2
All species	5,319.9	1,535.6	2,592.1	1,101.1	72.4	18.7

1/ Volume in the Pine Fringe is as follows:

Species	All stand sizes	Saw-timber	Pole-timber	Other areas
		Million cubic feet		
Pine	49.8	28.7	20.2	0.9
Other softwoods	.4	...	.1	.3
Oak	114.9	50.0	58.7	6.2
Other hardwoods	87.3	41.7	42.3	3.3
Total	252.4	120.4	121.3	10.7

2/ Includes areas not classified elsewhere.
3/ Negligible.

Table 20. --Average volume per acre[1/] of growing stock by forest type and Survey region, 1953-55

Forest type	East Texas	Northeast	Southeast
		Cubic feet	
Softwood types:			
Longleaf-slash pine	373	247	375
Loblolly-shortleaf pine	777	544	861
Oak-pine	517	364	660
Average	680	466	777
Hardwood types:			
Oak-hickory	368	306	513
Elm-ash-cottonwood	587	500	748
Oak-gum-cypress	691	532	807
Average	521	388	700
All types	629	429	759

1/ Average volume per acre in the Pine Fringe is as follows: softwood types, 459 cubic feet per acre; hardwood types, 409 cubic feet per acre; all types, 423 cubic feet per acre.

Table 21. --Average volume[1/] per acre of growing stock by stand size and forest type, 1953-55

Forest type	All stand sizes	Large saw-timber	Small saw-timber	Pole-timber	Seedling and sapling	Nonstocked and other areas[2/]
			Cubic feet			
Softwood types:						
Longleaf-slash pine	373	1,015	874	241	90	39
Loblolly-shortleaf pine	777	1,557	1,135	395	112	69
Oak-pine	517	1,193	891	391	110	19
Average	680	1,466	1,078	388	109	47
Hardwood types:						
Oak-hickory	368	859	807	348	85	99
Elm-ash-cottonwood	587	1,245	976	357	...	...
Oak-gum-cypress	691	1,050	1,003	438	254	132
Average	521	1,012	932	384	124	107
All types	629	1,276	1,052	386	114	67

1/ Average volume per acre in the Pine Fringe is as follows:

Forest type	All stand sizes	Saw-timber	Pole-timber	Other areas
		Cubic feet		
Softwood types	459	939	353	41
Hardwood types	409	916	365	103
All types	423	925	362	82

2/ Includes areas not classified elsewhere.

Table 22. --Sawtimber volume[1] by species and tree diameter, by Survey region, 1953-55

Species	All diameter classes	10 - 12 inches[2]	14 - 18 inches	20 - 24 inches	26 inches and up
		Million board feet			
EAST TEXAS					
Softwood:					
Loblolly pine	10,806.5	3,718.7	5,258.1	1,532.8	296.9
Shortleaf pine	5,371.0	3,022.3	2,241.3	107.4	...
Longleaf pine	905.0	348.1	499.5	57.4	...
Slash pine	1.9	1.9	...	...	...
Other softwoods	288.5	63.8	161.6	49.0	14.1
Total	17,372.9	7,154.8	8,160.5	1,746.6	311.0
Hardwood:					
Red oaks	2,686.5	428.3	1,306.0	623.2	329.0
White oaks	1,854.4	341.2	1,019.9	381.7	111.6
Sweetgum	1,750.7	394.2	1,016.6	288.2	51.7
Black and tupelo gums	794.2	141.5	452.5	150.3	49.9
Other hardwoods	2,031.2	440.2	1,095.0	347.0	149.0
Total	9,117.0	1,745.4	4,890.0	1,790.4	691.2
All species	26,489.9	8,900.2	13,050.5	3,537.0	1,002.2
NORTHEAST					
Softwood:					
Loblolly pine	1,047.7	366.6	456.5	181.3	43.3
Shortleaf pine	1,836.1	1,020.9	778.8	36.4	...
Longleaf pine	2.1	...	2.1	...	...
Slash pine	1.1	1.1	...	...	...
Other softwoods	56.0	13.3	27.3	15.4	...
Total	2,943.0	1,401.9	1,264.7	233.1	43.3
Hardwood:					
Red oaks	762.6	132.1	381.8	163.8	84.9
White oaks	680.2	160.4	367.1	107.7	45.0
Sweetgum	578.1	161.5	333.5	72.9	10.2
Black and tupelo gums	137.6	30.2	76.8	26.8	3.8
Other hardwoods	695.1	188.9	375.5	114.7	16.0
Total	2,853.6	673.1	1,534.7	485.9	159.9
All species	5,796.6	2,075.0	2,799.4	719.0	203.2
SOUTHEAST					
Softwood:					
Loblolly pine	9,758.8	3,352.1	4,801.6	1,351.5	253.6
Shortleaf pine	3,534.9	2,001.4	1,462.5	71.0	...
Longleaf pine	902.9	348.1	497.4	57.4	...
Slash pine	.8	.8	...	...	...
Other softwoods	232.5	50.5	134.3	33.6	14.1
Total	14,429.9	5,752.9	6,895.8	1,513.5	267.7
Hardwood:					
Red oaks	1,923.9	296.2	924.2	459.4	244.1
White oaks	1,174.2	180.8	652.8	274.0	66.6
Sweetgum	1,172.6	232.7	683.1	215.3	41.5
Black and tupelo gums	656.6	111.3	375.7	123.5	46.1
Other hardwoods	1,336.1	251.3	719.5	232.3	133.0
Total	6,263.4	1,072.3	3,355.3	1,304.5	531.3
All species	20,693.3	6,825.2	10,251.1	2,818.0	799.0

1/ Volume in the Pine Fringe is as follows:

Species	All diameter classes	10 - 12 inches[2]	14 - 18 inches	20 inches and up
	Million board feet			
Pine	197.2	76.7	104.2	16.3
Other softwoods	1.0	1.0	...	...
Oak	309.3	67.3	146.0	96.0
Other hardwoods	241.9	39.6	126.2	76.1
Total	749.4	184.6	376.4	188.4

2/ Hardwood sawtimber volume was not tallied in trees under 11.0 inches d.b.h.

Table 23. --Sawtimber volume[1] by species and stand size, by Survey region, 1953-55

Species	All stand sizes	Large saw-timber	Small saw-timber	Pole-timber	Seedling and sapling	Nonstocked and other areas[2]
			Million board feet			
EAST TEXAS						
Softwood:						
Loblolly pine	10,806.5	3,953.1	5,531.1	1,200.2	98.7	23.4
Shortleaf pine	5,371.0	1,046.5	3,469.5	804.9	44.8	5.3
Longleaf pine	905.0	155.8	566.9	101.9	57.5	22.9
Slash pine	1.9	...	...	1.5	.4	...
Other softwoods	288.5	97.9	175.5	10.3	4.8	...
Total	17,372.9	5,253.3	9,743.0	2,118.8	206.2	51.6
Hardwood:						
Red oaks	2,686.5	940.5	906.7	783.8	51.9	3.6
White oaks	1,854.4	534.4	627.5	596.7	83.4	12.4
Sweetgum	1,750.7	522.4	617.4	533.8	69.1	8.0
Black and tupelo gums	794.2	338.7	269.8	171.1	12.4	2.2
Other hardwoods	2,031.2	835.4	554.9	556.1	68.0	16.8
Total	9,117.0	3,171.4	2,976.3	2,641.5	284.8	43.0
All species	26,489.9	8,424.7	12,719.3	4,760.3	491.0	94.6
NORTHEAST						
Softwood:						
Loblolly Pine	1,047.7	335.7	416.6	258.5	34.5	2.4
Shortleaf pine	1,836.1	306.5	1,036.2	454.8	36.4	2.2
Longleaf pine	2.1	...	...	2.1	...	...
Slash pine	1.1	...	...	1.1	...	...
Other softwoods	56.0	13.9	39.4	2.7	...	...
Total	2,943.0	656.1	1,492.2	719.2	70.9	4.6
Hardwood:						
Red oaks	762.6	198.8	208.1	334.9	18.2	2.6
White oaks	680.2	85.2	203.6	334.1	49.7	7.6
Sweetgum	578.1	83.4	201.4	258.3	33.8	1.2
Black and tupelo gums	137.6	30.7	28.5	76.0	2.4	...
Other hardwoods	695.1	209.8	138.0	301.7	45.6	...
Total	2,853.6	607.9	779.6	1,305.0	149.7	11.4
All species	5,796.6	1,264.0	2,271.8	2,024.2	220.6	16.0
SOUTHEAST						
Softwood:						
Loblolly pine	9,758.8	3,617.4	5,114.5	941.7	64.2	21.0
Shortleaf pine	3,534.9	740.0	2,433.3	350.1	8.4	3.1
Longleaf pine	902.9	155.8	566.9	99.8	57.5	22.9
Slash pine	.8	...	...	.4	.4	...
Other softwoods	232.5	84.0	136.1	7.6	4.8	...
Total	14,429.9	4,597.2	8,250.8	1,399.6	135.3	47.0
Hardwood:						
Red oaks	1,923.9	741.7	698.6	448.9	33.7	1.0
White oaks	1,174.2	449.2	423.9	262.6	33.7	4.8
Sweetgum	1,172.6	439.0	416.0	275.5	35.3	6.8
Black and tupelo gums	656.6	308.0	241.3	95.1	10.0	2.2
Other hardwoods	1,336.1	625.6	416.9	254.4	22.4	16.8
Total	6,263.4	2,563.5	2,196.7	1,336.5	135.1	31.6
All species	20,693.3	7,160.7	10,447.5	2,736.1	270.4	78.6

1/ Volume in the Pine Fringe is as follows:

Species	All stand sizes	Saw-timber	Pole-timber	Other areas
		Million board feet		
Pine	197.2	135.4	61.2	.6
Other softwoods	1.0	...	.5	.5
Oak	309.3	175.4	117.9	16.0
Other hardwoods	241.9	145.1	90.9	5.9
Total	749.4	455.9	270.5	23.0

2/ Includes areas not classified elsewhere.

Table 24. --Sawtimber volume[1/] by species and Survey region, 1953-55

Species	East Texas	Northeast	Southeast
		Million board feet	
Softwood:			
Loblolly pine	10,806.5	1,047.7	9,758.8
Shortleaf pine	5,371.0	1,836.1	3,534.9
Longleaf pine	905.0	2.1	902.9
Slash pine	1.9	1.1	.8
Cypress	281.0	56.0	225.0
Other softwoods	7.5	...	7.5
Total	17,372.9	2,943.0	14,429.9
Hardwood:			
Black, scarlet, and southern red oaks	802.4	318.7	483.7
Cherrybark, Shumard, and northern red oaks	376.1	66.6	309.5
Water oaks	1,508.0	377.3	1,130.7
White oak (Q. alba)	562.3	126.9	435.4
Other white oaks	1,292.1	553.3	738.8
Pecan	188.3	73.6	114.7
Other hickories	447.8	203.0	244.8
Sweetgum	1,750.7	578.1	1,172.6
Black and tupelo gums	794.2	137.6	656.6
Cottonwood	7.8	4.6	3.2
Willow	85.6	56.7	28.9
Soft maple	44.9	10.6	34.3
Sweetbay and magnolia	200.5	9.0	191.5
Elm	369.5	133.6	235.9
Ash	282.4	97.6	184.8
Hackberry	106.7	51.0	55.7
Beech	152.7	14.5	138.2
Sycamore	51.6	4.5	47.1
Other hardwoods	93.4	36.4	57.0
Total	9,117.0	2,853.6	6,263.4
All species	26,489.9	5,796.6	20,693.3

1/ Volume in the Pine Fringe is as follows:

Species	Volume
	Million board feet
Loblolly pine	119.8
Shortleaf pine	77.4
Other softwoods	1.0
Soft hardwoods	95.6
Oaks	309.3
Other hard hardwoods	146.3
Total	749.4

Table 25.--Average sawtimber volume per acre[1/] of growing stock by forest type and Survey region, 1953-55

Forest type	East Texas	Northeast	Southeast
		Board feet	
Softwood types:			
Longleaf-slash pine	1,732	113	1,766
Loblolly-shortleaf pine	3,160	1,975	3,591
Oak-pine	1,593	939	2,198
Average	2,641	1,526	3,143
Hardwood types:			
Oak-hickory	951	686	1,574
Elm-ash-cottonwood	1,840	1,355	2,737
Oak-gum-cypress	2,211	1,493	2,734
Average	1,550	975	2,315
All types	2,288	1,269	2,954

1/ Average volume per acre in the Pine Fringe is as follows: softwood types, 1,598 board feet per acre; hardwood types, 1,120 board feet per acre; all types, 1,257 board feet per acre.

Table 26.--Average sawtimber volume[1/] per acre by stand size and forest type, 1953-55

Forest type	All stand sizes	Large sawtimber	Small sawtimber	Poletimber	Seedling and sapling	Nonstocked and other areas[2/]
			Board feet			
Softwood types:						
Longleaf-slash pine	1,732	5,790	4,098	800	438	194
Loblolly-shortleaf pine	3,160	8,036	4,741	971	366	273
Oak-pine	1,593	5,085	3,120	882	299	19
Average	2,641	7,369	4,415	933	352	200
Hardwood types:						
Oak-hickory	951	3,197	2,629	691	207	333
Elm-ash-cottonwood	1,840	4,629	2,893	891	...	...
Oak-gum-cypress	2,211	3,908	3,376	1,002	896	445
Average	1,550	3,768	3,102	819	368	362
All types	2,288	5,860	4,182	890	357	253

1/ Average volume per acre in the Pine Fringe is as follows:

Forest type	All stand sizes	Sawtimber	Poletimber	Other areas
		Board feet		
Softwood types	1,598	3,729	912	70
Hardwood types	1,120	3,338	781	232
All types	1,257	3,504	808	175

2/ Includes areas not classified elsewhere.

Table 27.--Softwood sawtimber volume[1/] by log grade and stand quality, by species group, and by Survey region, 1953-55

Species group and Survey region	All grades	Grade 1	Grade 2	Grade 3			Grade 4		
				Total	In fair and better stands	In poor stands	Total	In fair and better stands	In poor stands
				Million board feet					
Species group:									
Loblolly pine	10,806.5	242.4	1,555.3	4,382.6	2,142.2	2,240.4	4,626.2	2,073.0	2,553.2
Shortleaf pine	5,371.0	16.0	705.3	2,373.2	1,184.0	1,189.2	2,276.5	936.1	1,340.4
Other pines	906.9	3.0	123.4	370.6	163.0	207.6	409.9	110.5	299.4
Other softwoods	288.5	9.5	37.4	148.8	96.6	52.2	92.8	35.7	57.1
Total	17,372.9	270.9	2,421.4	7,275.2	3,585.8	3,689.4	7,405.4	3,155.3	4,250.1
Survey region:									
Northeast	2,943.0	28.6	325.1	1,162.1	452.1	710.0	1,427.2	399.6	1,027.6
Southeast	14,429.9	242.3	2,096.3	6,113.1	3,133.7	2,979.4	5,978.2	2,755.7	3,222.5
Total	17,372.9	270.9	2,421.4	7,275.2	3,585.8	3,689.4	7,405.4	3,155.3	4,250.1

1/ Softwood volume in the Pine Fringe is as follows:

Grade	Volume
	Million board feet
Grade 1	1.0
Grade 2	13.7
Grade 3	92.2
Grade 4	91.3
Total	198.2

Table 28.--Hardwood sawtimber volume[1/] by log class and stand quality, by species group, and by Survey region, 1953-55

Species group and Survey region	All classes	Standard lumber logs					Tie and timber logs		
		Grade 1	Grade 2	Grade 3					
				Total	In fair and better stands	In poor stands	Total	In fair and better stands	In poor stands
	Million board feet								
Species group:									
Red oaks	2,686.5	119.9	300.7	1,127.9	446.8	681.1	1,138.0	240.6	897.4
White oaks	1,854.4	86.2	263.9	815.5	265.5	550.0	688.8	148.7	540.1
Sweetgum	1,750.7	65.2	189.3	800.2	297.1	503.1	696.0	181.5	514.5
Black and tupelo gums	794.2	74.2	129.9	396.5	172.2	224.3	193.6	47.9	145.7
Other hardwoods	2,031.2	117.3	294.8	1,036.8	444.9	591.9	582.3	135.7	446.6
Total	9,117.0	462.8	1,178.6	4,176.9	1,626.5	2,550.4	3,298.7	754.4	2,544.3
Survey region:									
Northeast	2,853.6	82.7	292.4	1,391.8	264.0	1,127.8	1,086.7	112.4	974.3
Southeast	6,263.4	380.1	886.2	2,785.1	1,362.5	1,422.6	2,212.0	642.0	1,570.0
Total	9,117.0	462.8	1,178.6	4,176.9	1,626.5	2,550.4	3,298.7	754.4	2,544.3

1/ Hardwood volume in the Pine Fringe is as follows:

All classes	Volume
	Million board feet
Grade 1	58.1
Grade 2	92.8
Grade 3	285.5
Tie and timber logs	114.8
Total	551.2

Table 29.--Net annual growth of sawtimber and growing stock by species and class of timber, by Survey region, 1954

Class of timber	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Million cubic feet			Million board feet		
EAST TEXAS						
Sawtimber trees	348.5	240.4	108.1	1,726.0	1,283.0	443.0
Poletimber trees	91.6	39.5	52.1	...	...	...
Total	440.1	279.9	160.2	1,726.0	1,283.0	443.0
NORTHEAST						
Sawtimber trees	99.7	57.9	41.8	455.6	290.2	165.4
Poletimber trees	40.9	15.4	25.5	...	...	...
Total	140.6	73.3	67.3	455.6	290.2	165.4
SOUTHEAST						
Sawtimber trees	248.8	182.5	66.3	1,270.4	992.8	277.6
Poletimber trees	50.7	24.1	26.6	...	...	...
Total	299.5	206.6	92.9	1,270.4	992.8	277.6

Table 30.--Net annual growth per acre of sawtimber and growing stock, by forest-type and stand-size group, by Survey region, 1954

Stand-size group	Growing stock			Sawtimber		
	All types	Softwood types	Hardwood types	All types	Softwood types	Hardwood types
	Cubic feet			Board feet		
EAST TEXAS						
Sawtimber	55	61	37	259	297	146
Poletimber	32	38	24	95	115	62
Other stand sizes	13	14	9	35	44	17
All stands	38	44	25	149	182	80
NORTHEAST						
Sawtimber	51	65	31	231	311	123
Poletimber	31	37	23	81	104	56
Other stand sizes	13	15	9	27	38	15
All stands	31	39	22	100	135	60
SOUTHEAST						
Sawtimber	56	60	40	266	295	158
Poletimber	34	38	25	108	122	71
Other stand sizes	12	14	7	44	48	26
All stands	43	46	31	181	203	108

Table 31.--Annual cut of sawtimber and growing stock by species, 1954

Species	Growing stock	Sawtimber
	Million cu. ft.	Million bd. ft.
Softwood:		
Pines	228.3	1,170.0
Other softwoods	.5	2.3
Total	228.8	1,172.3
Hardwood:		
Red oaks	23.0	92.2
White oaks	22.3	90.0
Other hard hardwoods	4.3	17.8
Black and tupelo gums	4.4	21.4
Sweetgum	18.7	81.5
Other soft hardwoods	.7	3.4
Total	73.4	306.3
All species	302.2	1,478.6

Table 32. --Annual cut of sawtimber and growing stock, by species group and class of timber, by Survey region, 1954

Class of timber	Growing stock			Sawtimber		
	All species	Softwood	Hardwood	All species	Softwood	Hardwood
	Million cubic feet			Million board feet		
EAST TEXAS						
Sawtimber trees	280.2	208.7	71.5	1,478.6	1,172.3	306.3
Poletimber trees	22.0	20.1	1.9	...	...	...
Total	302.2	228.8	73.4	1,478.6	1,172.3	306.3
NORTHEAST						
Sawtimber trees	82.1	56.1	26.0	415.1	308.0	107.1
Poletimber trees	11.4	10.4	1.0	...	...	...
Total	93.5	66.5	27.0	415.1	308.0	107.1
SOUTHEAST						
Sawtimber trees	198.1	152.6	45.5	1,063.5	864.3	199.2
Poletimber trees	10.6	9.7	.9	...	...	...
Total	208.7	162.3	46.4	1,063.5	864.3	199.2

Table 33. --Total number of live trees[1/] by species group and Survey region (1953-55) and change between Surveys (1935 and 1953-55)

Diameter class (inches)	Softwood		Hardwood	
	Thousand trees	Percent change	Thousand trees	Percent change
EAST TEXAS				
2-4	1,214,036	+ 27	3,449,926	+ 74
6-8	317,324	+ 3	430,260	+ 33
10-12	116,460	- 5	160,961	+ 28
14-18	43,065	+ 16	78,392	+ 17
20 and up	4,119	- 19	18,147	- 9
Total	1,695,004	+ 19	4,137,686	+ 64
NORTHEAST				
2-4	414,720	+ 27	1,240,909	+ 93
6-8	104,604	- 9	181,939	+ 34
10-12	25,965	- 43	69,239	+ 32
14-18	7,309	- 42	29,687	+ 15
20 and up	576	- 65	6,541	- 13
Total	553,174	+ 10	1,528,315	+ 77
SOUTHEAST				
2-4	799,316	+ 27	2,209,017	+ 65
6-8	212,720	+ 10	248,321	+ 32
10-12	90,495	+ 19	91,722	+ 25
14-18	35,756	+ 46	48,705	+ 19
20 and up	3,543	+ 4	11,606	- 8
Total	1,141,830	+ 24	2,609,371	+ 58

1/ Includes both cull and growing stock trees.

STANDARD TABLES

Tables identical in format to those that follow will be found in all State reports issued by the Forest Survey. Their purpose is to facilitate compilation of data for various States and regions.

Table I. --Land area, by major classes of land, east Texas, 1953-55

Class of land	Area
	Thousand acres
Forest:	
Commercial	11,575.8
Noncommercial:	
Productive-reserved	5.4
Unproductive	74.6
Total	11,655.8
Nonforest[1/]	7,382.9
Total, all classes	19,038.7

1/ Includes some acreage of water according to Survey standards of area classification but defined by the Bureau of Census as land.

Table II. --Commercial forest land area, by ownership class, east Texas, 1953-55

Ownership class	Area
	Thousand acres
Federally owned or managed:	
National forest	655.0
Indian	3.7
Bureau of Land Management	...
Other	77.7
Total	736.4
State	28.7
County and municipal	2.1
Private:	
Farm	2,457.4
Industrial and other	8,351.2
Total	10,808.6
All ownerships	11,575.8

Table III. --Area of commercial forest land, by major forest types, east Texas, 1953-55

Forest type	Thousand acres
Longleaf-slash pine	482.1
Loblolly-shortleaf pine	5,198.4
Oak-pine	2,156.0
Oak-hickory	1,940.4
Oak-gum-cypress	1,724.3
Elm-ash-cottonwood	74.6
Total	11,575.8

Table IV. --Net volume of live sawtimber and growing stock on commercial forest land, by stand-size class, east Texas, 1953-55

Stand-size class	Sawtimber	Growing stock
	Million board feet	Million cubic feet
Sawtimber stands	21,144.0	5,033.3
Poletimber stands	4,760.3	2,066.8
Seedling and sapling stands	491.0	157.2
Nonstocked and other areas not elsewhere classified	94.6	24.9
Total	26,489.9	7,282.2

Table V. --Net volume of live sawtimber and growing stock on commercial forest land, by ownership class, east Texas, 1953-55

Ownership class	Sawtimber	Growing stock
	Million board feet	Million cubic feet
Federally owned or managed:		
National forest	3,462.9	760.1
Indian	12.0	2.5
Bureau of Land Management	...	...
Other	140.9	39.3
Total	3,615.8	801.9
State	86.5	21.4
County and municipal	7.0	1.6
Private:		
Farm	3,120.2	1,065.3
Industrial and other	19,660.4	5,392.0
Total	22,780.6	6,457.3
All ownerships	26,489.9	7,282.2

Table VI. --Net volume of live sawtimber and growing stock on commercial forest land, by species, east Texas, 1953-55

Species	Sawtimber	Growing stock
	Million board feet	Million cubic feet
Softwoods:		
Longleaf and slash pines	906.9	190.8
Shortleaf and loblolly pines	16,177.5	3,724.4
Cypress	281.0	60.2
Other eastern softwoods	7.5	1.9
Total	17,372.9	3,977.3
Hardwoods:		
White oaks (Q. alba and michauxii)	695.9	205.8
Red oaks (Q. rubra, shumardii, and falcata var. pagodaefolia)	376.1	110.9
Other white oaks	1,158.5	486.5
Other red oaks	2,310.4	806.4
Sugar maple	18.3	6.4
Soft maples	44.9	22.6
Beech	152.7	44.8
Sweetgum	1,750.7	652.3
Tupelo and blackgum	794.2	253.7
Ash	282.4	104.0
Hickory	636.1	233.5
Cottonwood	7.8	2.9
Basswood	17.0	5.8
Yellow-poplar	...	.1
Black walnut	6.7	2.4
Other eastern hardwoods	865.3	366.8
Total	9,117.0	3,304.9
All species	26,489.9	7,282.2

Table VII. --Net volume of live sawtimber on commercial forest land, by diameter class groups and species, east Texas, 1953-55

Species	Diameter class groups						Total
	10 inches	12 inches	14 inches	16 inches	18 inches	20 inches and up	
	- - - - - - - - - - - - Million board feet - - - - - - - - - - - - - -						
Southern yellow pines	3,195.8	3,895.2	3,552.3	2,637.2	1,809.4	1,994.5	17,084.4
Other eastern softwoods	19.1	44.7	53.4	60.0	48.2	63.1	288.5
White oaks (Q. alba and michauxii)	...	96.8	143.9	149.8	105.2	200.2	695.9
Other white oaks	...	244.4	257.0	217.9	146.1	293.1	1,158.5
Red oaks (Q. rubra, falcata var. pagodaefolia and shumardii)	...	49.9	65.6	62.8	45.7	152.1	376.1
Other red oaks	...	378.4	423.1	419.1	289.7	800.1	2,310.4
Sugar maple	...	5.2	4.8	4.3	...	4.0	18.3
Beech	...	23.0	38.1	19.5	23.3	48.8	152.7
Sweetgum	...	394.2	431.6	326.4	258.6	339.9	1,750.7
Tupelo and blackgum	...	141.5	170.2	166.8	115.5	200.2	794.2
Other eastern hardwoods	...	412.0	411.9	325.5	267.6	443.2	1,860.2

Table VIII. --Net volume of all timber on commercial forest land, by class of material and species group, east Texas, 1953-55

Class of material	Total	Softwoods	Hardwoods
	- - - - - Million cubic feet - - - - -		
Growing stock:			
Sawtimber trees:			
Sawlog portion	4,360.6	2,913.8	1,446.8
Upper stem portion	979.2	226.4	752.8
Total	5,339.8	3,140.2	2,199.6
Poletimber trees	1,942.4	837.1	1,105.3
Total growing stock	7,282.2	3,977.3	3,304.9
Other material:			
Sound cull trees	855.3	28.9	826.4
Rotten cull trees	282.2	2.7	279.5
Hardwood limbs	401.1	...	401.1
Salvable dead trees	29.0	13.1	15.9
Total other material	1,567.6	44.7	1,522.9
Total, all timber	8,849.8	4,022.0	4,827.8

Table IX. --Net annual growth, annual mortality, and annual cut of live sawtimber and growing stock on commercial forest land, by species group, east Texas, 1954

Item	Sawtimber			Growing stock		
	All species	Soft-woods	Hard-woods	All species	Soft-woods	Hard-woods
	- - - Million board feet - - -			- - - Million cubic feet - - -		
Net annual growth	1,726.0	1,283.0	443.0	440.1	279.9	160.2
Annual mortality	158.9	104.2	54.7	49.5	26.4	23.1
Annual cut						
Timber products	1,449.2	1,157.2	292.0	263.4	211.4	52.0
Logging residues	29.4	15.1	14.3	38.8	17.4	21.4
Total annual cut	1,478.6	1,172.3	306.3	302.2	228.8	73.4

Table X. --Output of timber products and annual cut of live sawtimber and growing stock, east Texas, 1954

Product	Output of timber products					Annual cut of sawtimber			Annual cut of growing stock		
	Volume in standard units		Roundwood volume								
	Standard units	Number	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods	Total	Soft-woods	Hard-woods
			Thousand cubic feet			Thousand board feet			Thousand cubic feet		
Sawlogs	MBM[1]	1,032,027	168,366	133,417	34,949	1,060,887	856,024	204,863	196,091	147,172	48,919
Veneer logs and bolts	MBM[1]	49,999	6,999	51	6,948	55,129	296	54,833	10,074	56	10,018
Cooperage logs and bolts	MBM[1]	1,306	188	...	188	1,825	...	1,825	436	...	436
Pulpwood	Std. cords[2]	[3]1,033,762	78,062	74,286	3,776	281,466	270,204	11,262	73,546	69,792	3,754
Fuelwood	Std. cords[2]	[4]152,502	11,439	112	11,327	3,244	188	3,056	2,479	44	2,435
Piling	M linear feet	1,346	861	861	...	4,977	4,977	...	1,013	1,013	...
Poles	M pieces	617	6,583	6,583	...	38,053	38,053	...	7,743	7,743	...
Posts	M pieces	5,351	3,024	1,431	1,593	5,133	192	4,941	2,810	1,364	1,446
Hewn ties	M pieces	349	2,450	225	2,225	18,612	1,664	16,948	4,244	306	3,938
Miscellaneous[5]	M cu. ft.	[6]2,329	2,329	760	1,569	9,227	670	8,557	3,811	1,311	2,500
Total			280,301	217,726	62,575	1,478,553	1,172,268	306,285	302,247	228,801	73,446

1/ International 1/4-inch rule.
2/ Rough wood basis.
3/ Not including 6.1 million cubic feet of wood from mill residues used for pulp.
4/ Not including 61.2 million cubic feet of wood from mill residues used for domestic and industrial fuel.
5/ Includes mine timbers, handle stock, other miscellaneous dimension stock, etc.
6/ Not including 2.5 million cubic feet of mill residues used for miscellaneous products.

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